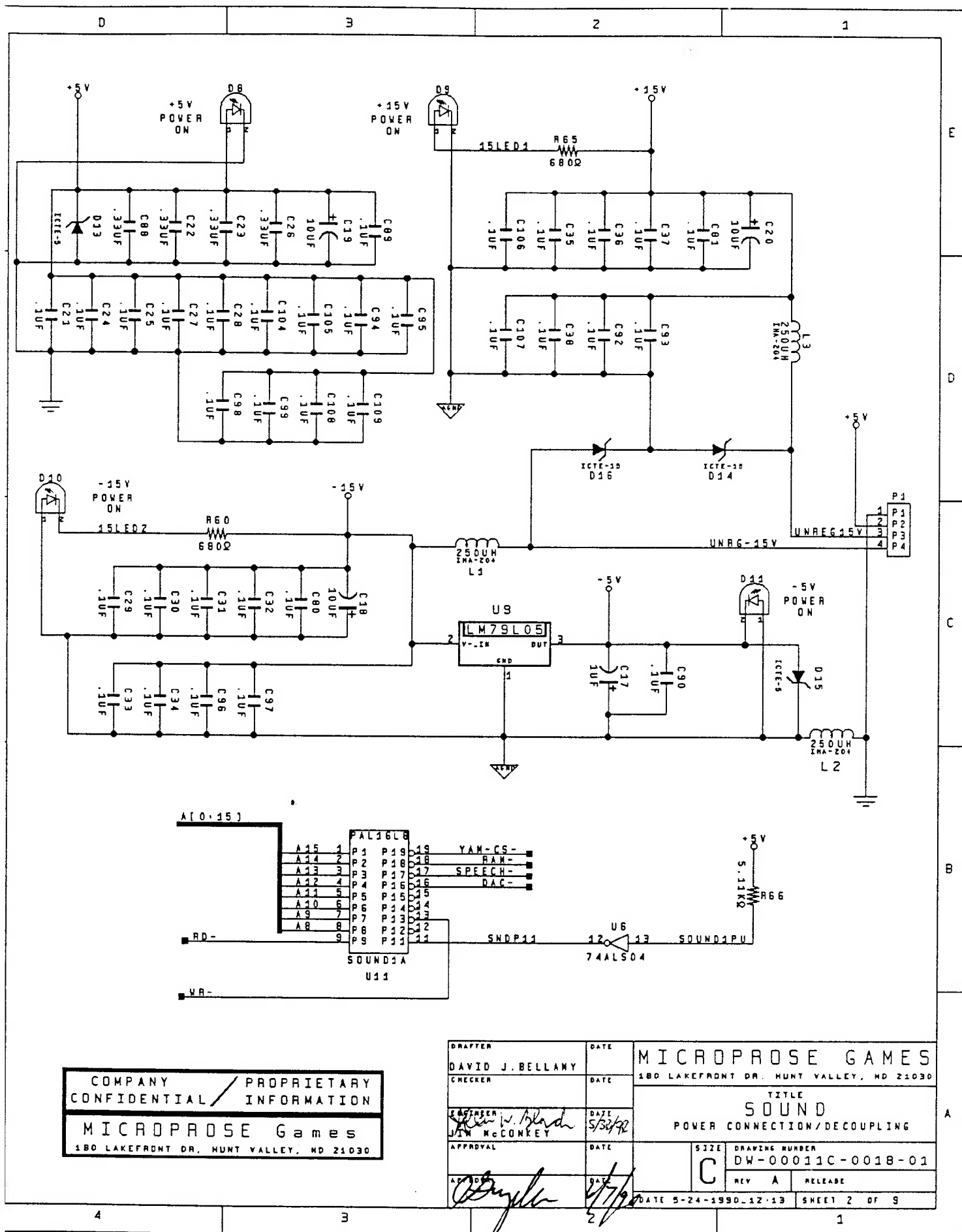


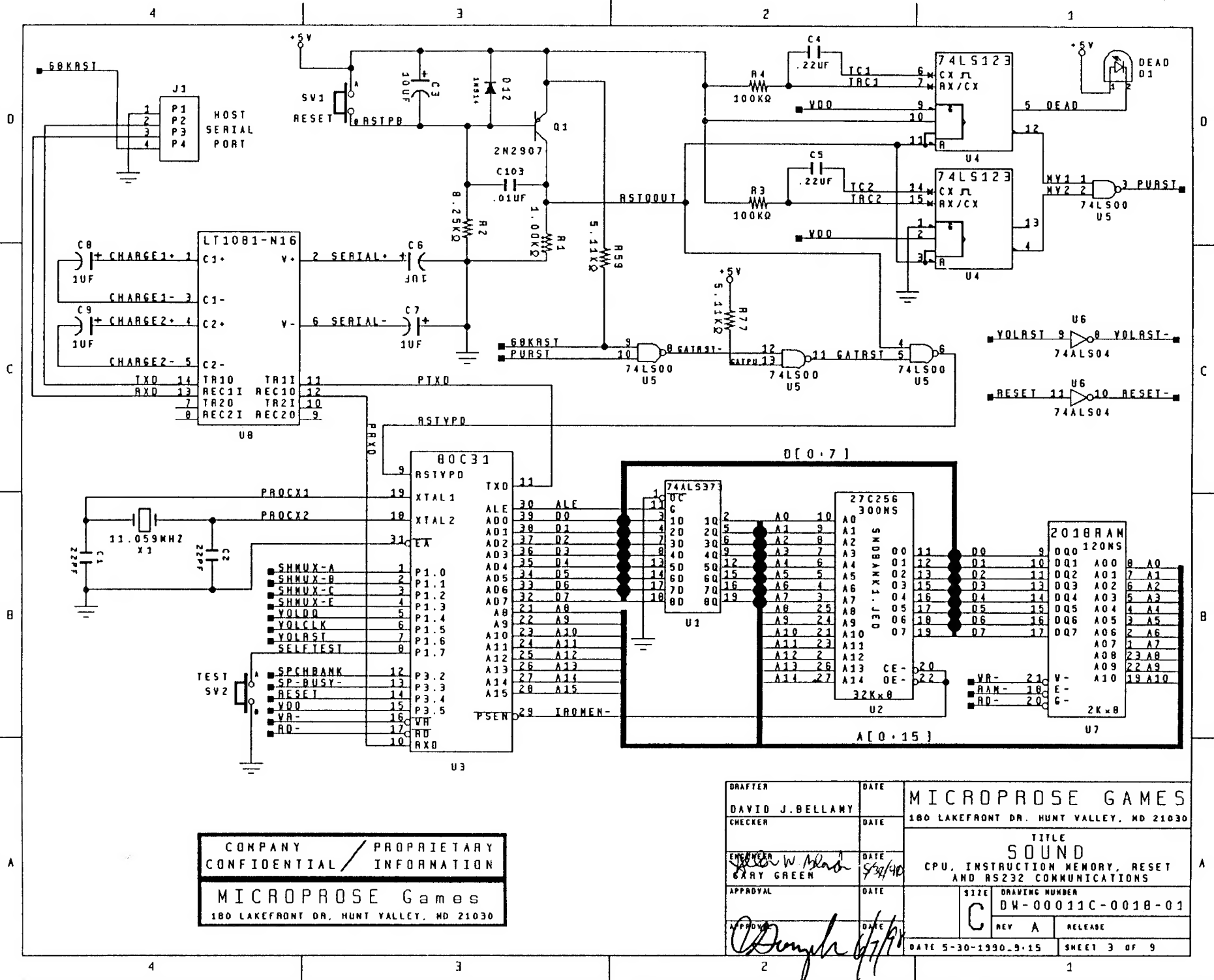
SOUND
PRINTED CIRCUIT
BOARD ASSEMBLY

COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE	TITLE	
EPINGER	DATE	SOUND	
ALLEN BLACK	5/3/80	PRINT CIRCUIT BOARD ASSEMBLY	
APPROVAL	DATE	SIZE	DRAWING NUMBER
		C	OW-00011C-0018-01
APPROVAL	DATE	REV	A
	1/5/80	RELEASE	
		DATE 5-30-1990	10-21
		SHEET 1	OF 9

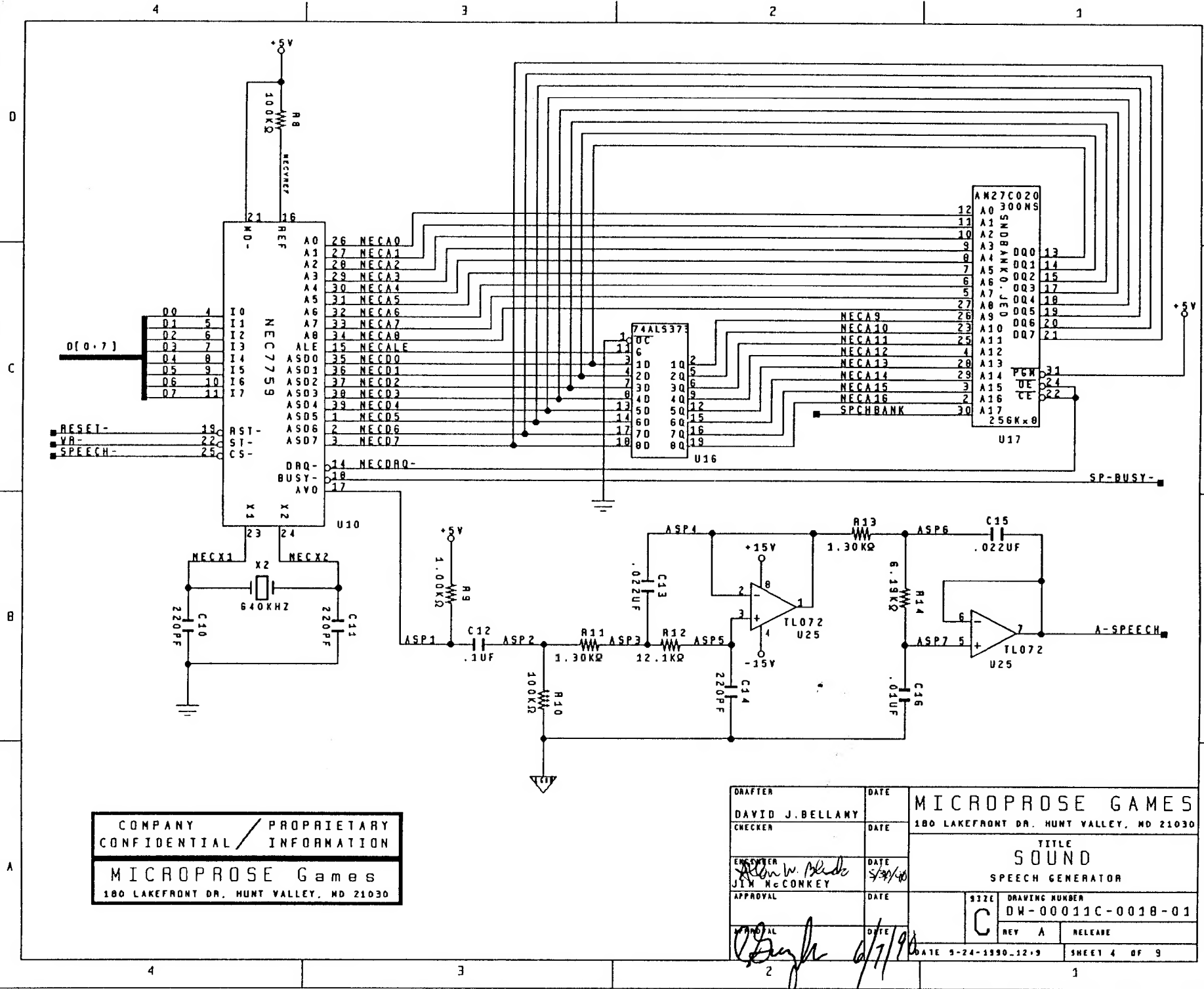




COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION

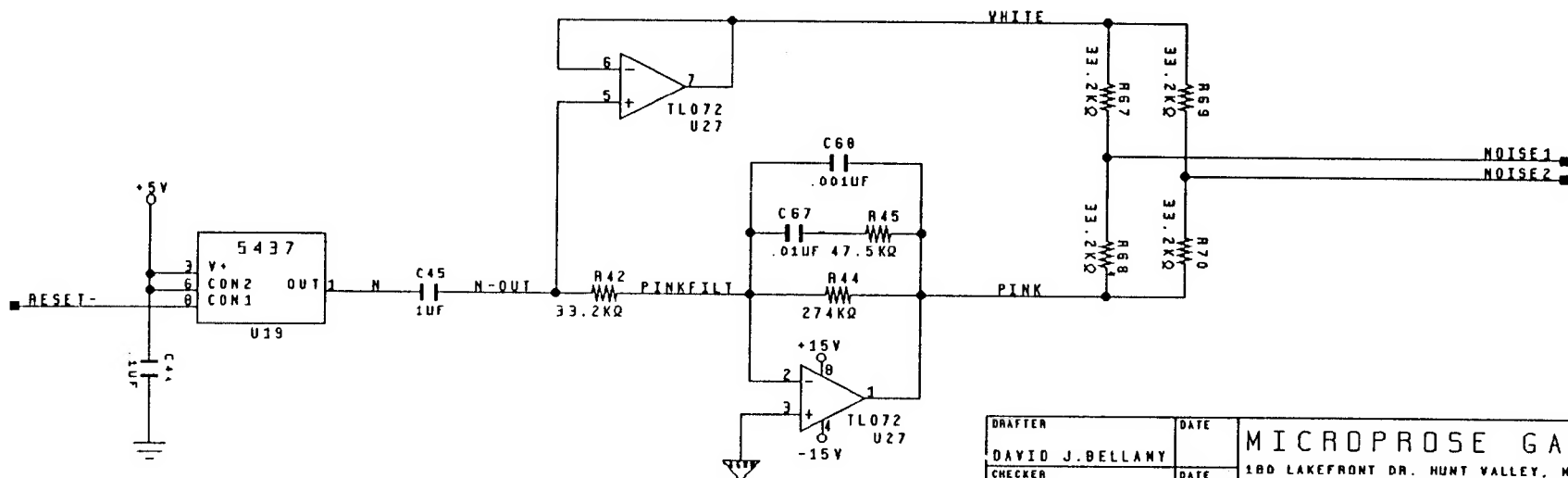
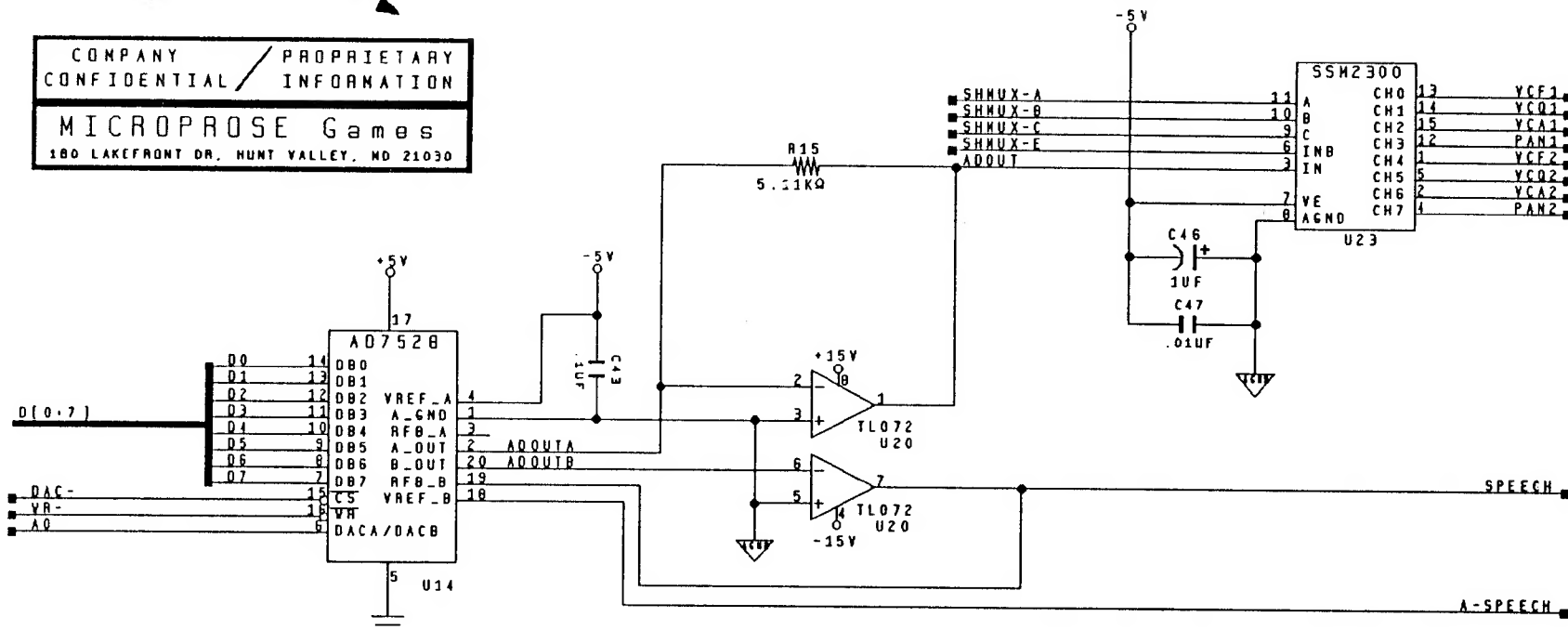
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER		DATE		MICROPROSE GAMES	
DAVID J. BELLAMY				180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER		DATE		TITLE	
GARY GREEN		5/29/90		CPU, INSTRUCTION MEMORY, RESET AND RS232 COMMUNICATIONS	
APPROVAL		DATE		SIZE	
C. D. Dwyer		6/7/91		DW-00011C-0018-01	
APPROVED		DATE		REV A	
		5-30-1990-9-15		RELEASE	
				SHEET 3 OF 9	

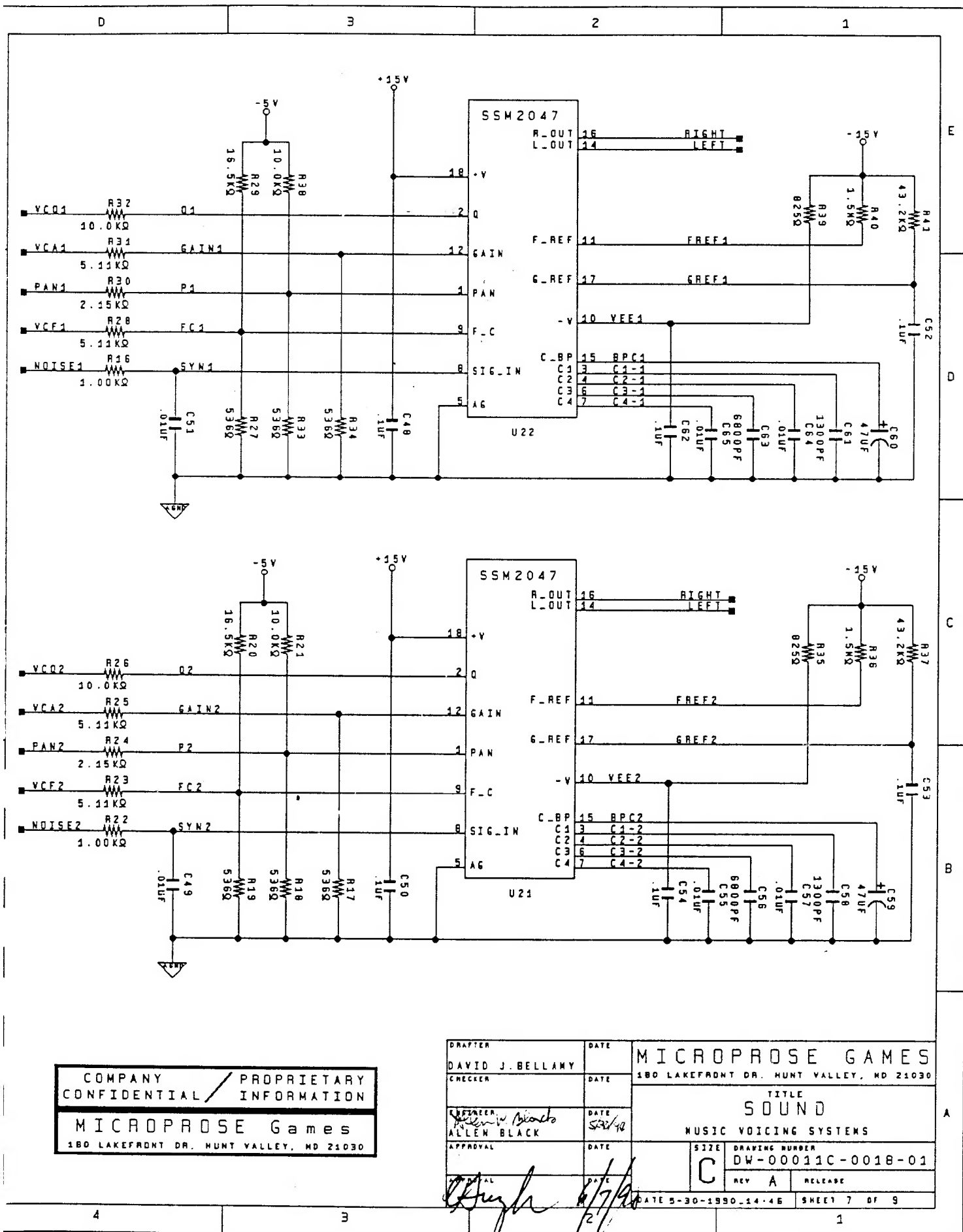


COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030



DRAFTER DAVID J. BELLAMY		DATE		MICROPROSE GAMES 180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER		DATE			
ENGINEER Allen W. Black		DATE 5/30/90		TITLE SOUND NOISE GENERATOR, A/D AND SPECIAL EFFECT S & H	
APPROVAL		DATE			
DATE 6/1/90		DATE 6/1/90		SIZE C	
				DRAWING NUMBER DW-00011C-001B-01	
				REV A RELEASE	
				DATE 5-30-1990-10-15 SHEET 6 OF 9	

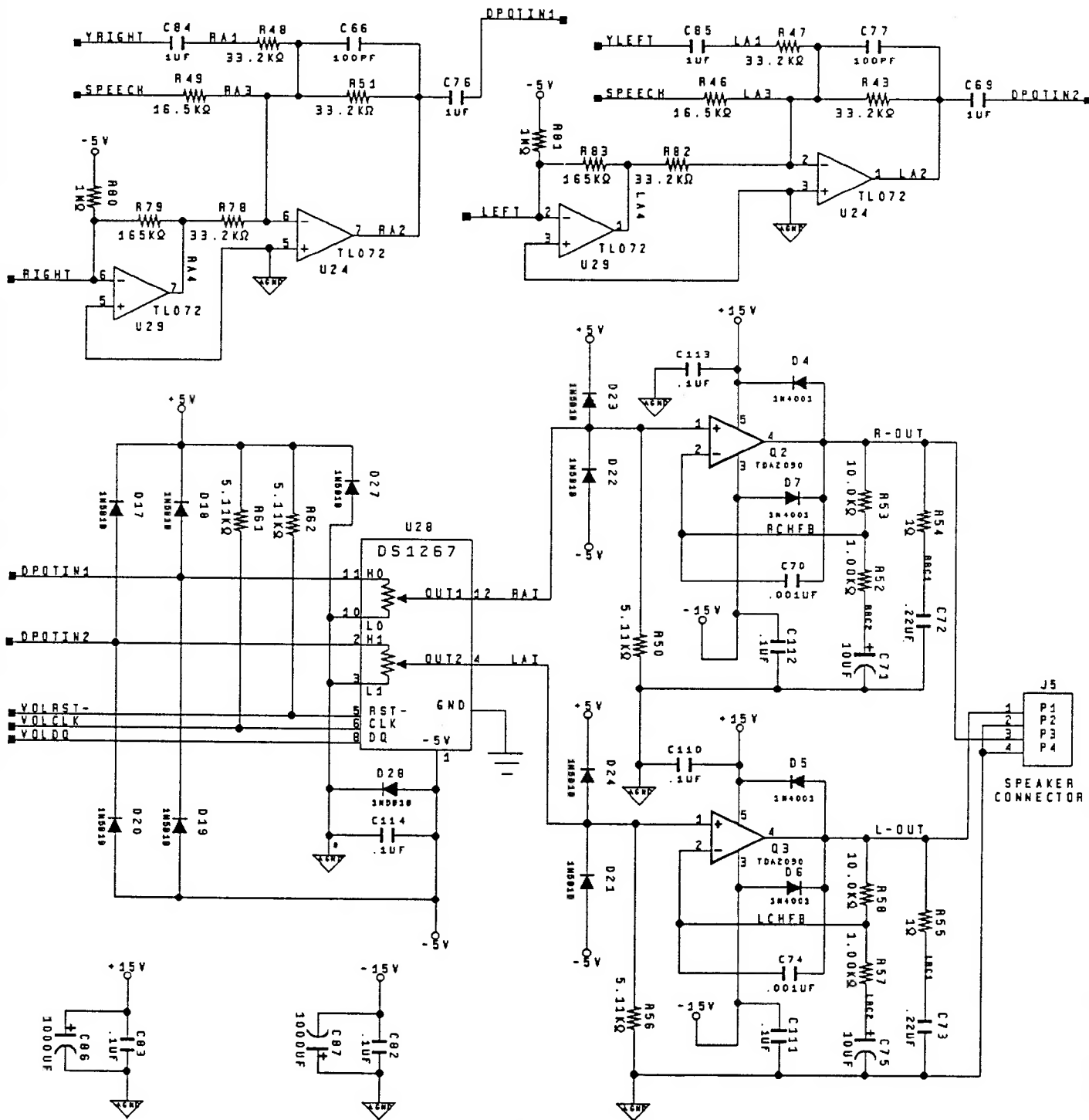


COMPANY CONFIDENTIAL / PROPRIETARY INFORMATION
MICROPROSE Games
 180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY		DATE		MICROPROSE GAMES 180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER		DATE			
CUSTOMER ALLEN BLACK		DATE 5/7/90		TITLE SOUND	
APPROVAL		DATE		MUSIC VOICING SYSTEMS	
<i>[Signature]</i>		DATE 5/7/90		DRAWING NUMBER DW-00011C-0018-01	
				REV A RELEASE	
				SHEET 7 OF 9	

RIGHT

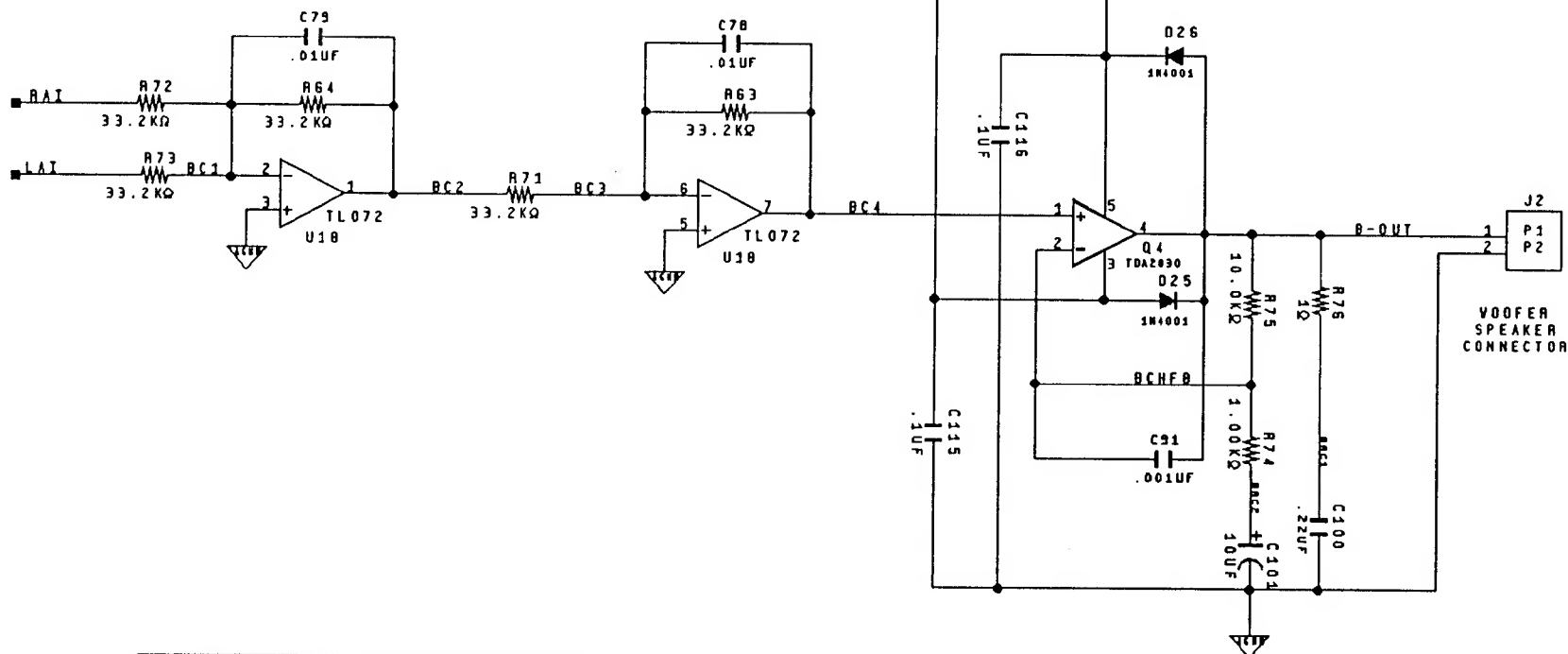
LEFT



COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY		DATE		MICROPROSE GAMES	
CHECKER		DATE		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
DESIGNER ALLEN BLACK		DATE 5/30/90		TITLE SOUND	
APPROVAL		DATE		LEFT AND RIGHT CHANNEL OUTPUT AUDIO AMPLIFIERS	
ATTACHED		DATE		DRAWING NUMBER DW-00011C-0018-01	
				REV A RELEASE	
				DATE 5-30-1990-14-50 SHEET 8 OF 9	

BASS



COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION

MICROPROSE Games

180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER		DATE		MICROPROSE GAMES 180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
DAVID J. BELLAMY					
CHECKER		DATE		TITLE SOUND BASS OUTPUT AUDIO AMPLIFIER	
ENGINEER		DATE		DRAWING NUMBER DW-00011C-0018-01	
W. W. Black ALLEN BLACK		5/24/90			
APPROVAL		DATE		REV A RELEASE	
DATE		DATE		DATE 5-30-1990-14-52	
				SHEET 9 OF 9	

MICROPROSE GAMES, 180 Lakefront Drive, Hunt Valley, Maryland 21030

PROJECT: SOUND BOARD DRWG NO: PL-00011A-00018-01 REV: C

DATE: Wed 1-Aug-1990

ITEM	QTY	VENDOR	PART NUMBER	PART DESC	VALUE	MPG P/N
		REF.	DES.			
1	2	CCF-07	155J R40,R36	5PCMFRES	1.5MOHM	503-00005-155
2	1	CCF-50	2743F R44	1PCMFRES	274KOHM	503-00001-274
3	4	CCF-50	1003F R3,R4,R8,R10	1PCMFRES	100KOHM	503-00001-104
4	1	CCF-50	4752F R45	1PCMFRES	.47.5KOHM	503-00001-473
5	2	CCF-50	4322F R37,R41	1PCMFRES	43.2KOHM	503-00001-433
6	9	CCF-50	3322F [R73,R72,R71,R64,R63],R51,R48,R47,R43,R42,R78,R82,R68,R70	1PCMFRES	33.2KOHM	503-00001-333
7	4	CCF-50	1652F R20,R29,R46,R49	1PCMFRES	16.5KOHM	503-00001-163
8	1	CCF-50	1212F R12	1PCMFRES	12.1KOHM	503-00001-123
9	6	CCF-50	1002F R21,R26,R32,R38,R58,R53,[R75]	1PCMFRES	10.0KOHM	503-00001-103
10	1	CCF-50	8251F R2	1PCMFRES	8.25KOHM	503-00001-822
11	1	CCF-50	6191F R14	1PCMFRES	6.19KOHM	503-00001-612
12	12	CCF-50	5111F R62,R61,R56,R50,R23,R25,R31,R28,R15,R59,R66,R77	1PCMFRES	5.11KOHM	503-00001-512
13	2	CCF-50	2151F R24,R30	1PCMFRES	2.15KOHM	503-00001-212
14	2	CCF-50	1301F R13,R11	1PCMFRES	1.30KOHM	503-00001-132
15	6	CCF-50	1001F R1,R9,R16,R22,R52,R57,[R74]	1PCMFRES	1.00KOHM	503-00001-102
16	2	CCF-07	681G R60,R65	2PCMFRES	680 OHM	503-00002-681
17	6	CCF-50	5360F R34,R19,R18,R17,R33,R27	1PCMFRES	536 OHM	503-00001-541

ITEM	QTY	VENDOR PART NUMBER	PART DESC	VALUE	MPG P/N
		REF. DES.			
18	2	CCF-50 3010F R6,R5	1PCMFRES	301 OHM	503-00001-301
19	1	CCF-50 2740F R7	1PCMFRES	274 OHM	503-00001-001
20	2	5053EM1R00J R55,R54,[R76]	5PCMFRES	1 OHM	503-00005-010
21					
22	2	513D108M016DK4 C87,C86	RADTANTCAP	1000UF	410-00002-108
23	2	TAP476M020CRW C59,C60	RADTANT	47UF	421-00020-476
24	7	173D106X0035X C3,C40,C71,C75,C18,C19,C20,[C101]	AXTANT	10UF	422-00072-106
25	6	173D105X0035V C46,C17,C7,C6,C9,C8	AXTANTCAP	1UF	422-00072-105
26	5	C340C105K5R5CA C85,C76,C69,C84,C45	RADCERCAP	1UF	400-00281-105
27	4	C412C334M5U5CA C23,C22,C26,C88	AXCERCAP	.33UF	402-00382-334
28	36	C410C104M5U5CA C44,C43,C99,C98,C97,C96,C95,C94,C93,C92,C38,C37,C36,C35,C113 C34,C33,C32,C31,C30,C28,C27,C25,C24,C21,C29,C80,C81,C89,C90, C104,C105,C106,C107,C108,C109,[C114,C115,C116,C110,C111,C112]	AXCERCAP	.1UF	402-00382-104
29	4	C430C224J5R5CA C4,C5,C72,C73,[C100]	AXCERCAP	.22UF	402-00285-224
30	10	C412C104J5R5CA C83,C82,C48,C50,C53,C54,C52,C62,C12,C102	AXCERCAP	.1UF	402-00285-104
31	2	C410C223J5R5CA C15,C13	AXCERCAP	.022UF	402-00285-223
32	10	C410C103J5R5CA C51,C49,C55,C57,C64,C65,C67,C47,C16,C103,[C78,C79]	AXCERCAP	.01UF	402-00285-103
33	3	C410C102J1R5CA C68,C70,C74,[C91]	AXCERCAP	.001UF	402-00295-102
34	2	C410C222J1R5CA C42,C41	AXCERCAP	2200PF	402-00295-222
35	3	C410C221J1G5CA C10,C14,C11	AXCERCAP	220PF	402-00195-221

ITEM	QTY	VENDOR PART NUMBER	PART DESC	VALUE	MPG P/N
		REF. DES.			
36	2	C410C101J1G5CA C66,C77	AXCERCAP	100PF	402-00195-101
37	3	C410C220J1G5CA C39,C2,C1	AXCERCAP	22PF	402-00195-220
38	2	SX268J C63,C56	POLYFILMCAP	6800PF	430-00002-682
39	2	SXM213H C61,C58	POLYFILMCAP	1300PF	430-00001-132
40	2	ICTE-15 D14,D16	ZENER	15V	300-00001-005
41	2	ICTE-5 D13,D15	ZENER	5V	300-00001-002
42	10	1N5818 D17,D18,D19,D20,D21,D22,D23,D24,D27,D28	SCHOTDIODE		302-00002-001
43	4	1N4001 D7,D6,D5,D4,[D25,D26]	DIODE,RECT		302-00001-001
44	1	1N914 D12	DIODE,SIGNAL		300-00002-003
45	7	HLMP3600 D8,D3,D2,D1,D9,D10,D11	LED	RED	305-00003-002
46	3	IHA-204 L1,L2,L3	INDUCTOR	250 UH	590-00001-001
47	1	NYP 111-20 X1	OSCILLATOR	11.06MHZ	290-00003-011
48	1	NYP035A-18 X3	SNDXTAL	3.58MHZ	290-00003-003
49	1	CSB640J X2	CERRESONATR	640KHZ	290-00005-640
50	1	15-24-4049 P1	4PINPWRCON	.200"	610-00300-004
51	2	22-23-2041 J1,J5	4PINMOLEX	.100"	610-00102-004
52	[0]	22-23-2021 [J2]	2PINMOLEX	.100"	610-00102-002
53	2	KSA1A211 SW2,SW1	PBSWITCH		625-00002-001

ITEM	QTY	VENDOR PART NUMBER	PART DESC	VALUE	MPG P/N
		REF. DES.			
54	1	2-644018-2 UX17	32PIN SOCKET	.600"	600-00003-632
55	1	ICO-628MTT UX2	28PIN SOCKET	.600"	600-00001-628
56	[0]	ICO-320MTT [UX11]	20PIN SOCKET	.300"	600-00001-320
57	[0]	2-641606-1 [UX3]	40PIN SOCKET	.600"	600-00003-640
58	2	7-0805G-5 TP1,TP2	TEST PIN		710-00001-001
59	2	7023BCLP	HEATSINK		790-00001-001
60	2	CLP201	CLIP, HEATSINK		790-00001-002
61	1	DS1267-50 U28	DUAL DIGPOTS	50KOHM	282-01267-200
62	1	P80C31BH U3	MICROPROCESSOR	12MHZ	135-80C31-212
63	1	UPD7759CADPC U10	SPEECH GEN		282-07759-200
64	1	MM5437 U19	NOISE GENER		282-05437-200
65	1	YM2151 U12	MUSIC SYNTH		282-02151-200
66	1	YM3012 U13	STEREO DAC		282-03012-200
67	2	TDA2030V Q3,Q2,[Q4]	AUDIO AMP		282-02030-600
68	7	TL072ACP U24,U27,U20,U26,U15,U25,U29,[U18]	DUAL OPAMP		282-00072-200
69	1	MC79L05ACZ U9	NEG5V REG		281-07905-001
70	1	TP2907 Q1	PNP TRANS		310-00001-001
71	1	PAL16L8-BCN U11	SOUND1A	15NS	120-00003-001
72	1	AM27C020-305DC U17	256Kx8 EPROM SNDBANK0.JED	300NS	110-00003-001

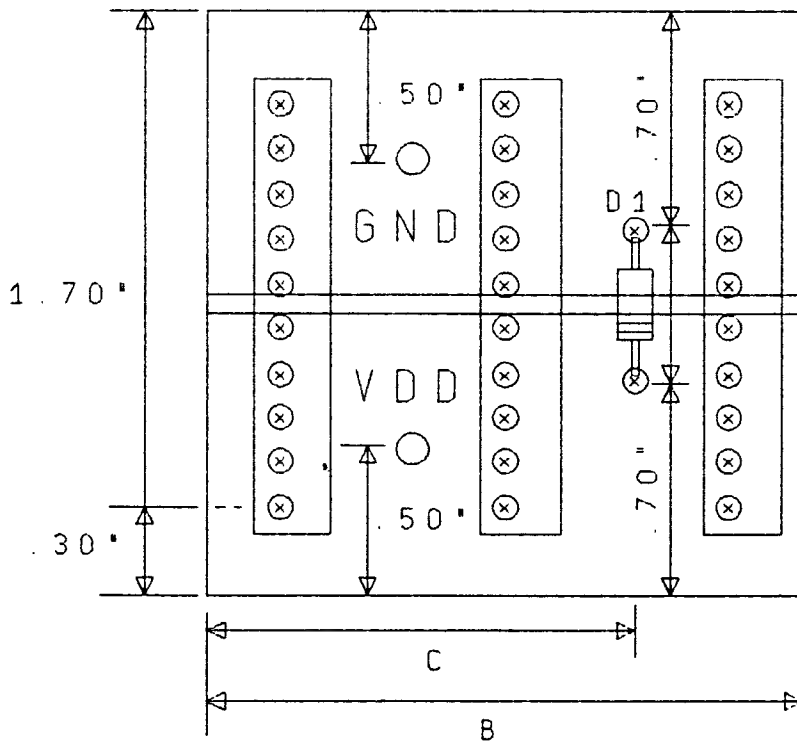
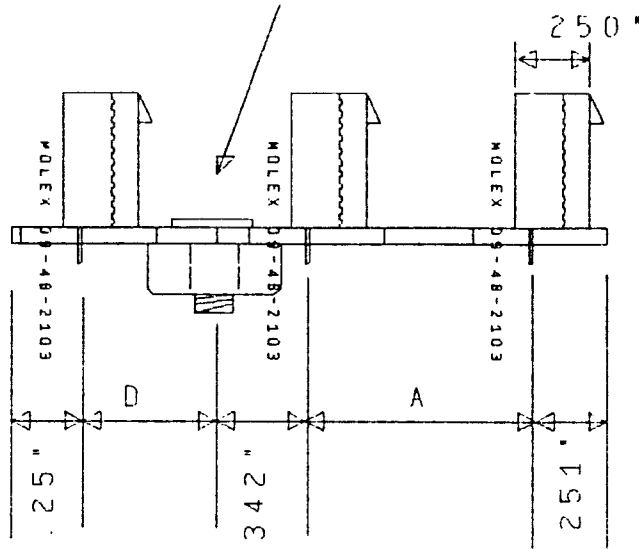
ITEM	QTY	VENDOR PART NUMBER	PART DESC	VALUE	MPG P/N
		REF. DES.			
73	1	MCM2018AN45 U7	2Kx8SRAM	45NS	221-00004-245
74	1	D27C256-3 U2	32Kx8EPROM SNDBANK1.JED	300NS	110-00004-001
75	2	SSM-2047P U22,U21	MUSICVOICE		282-02047-200
76	1	SSM-2300P U23	8CHANS/HOLD		282-02300-200
77	1	AD7528JN U14	D/A CONVRTR		245-00003-200
78	1	LT1081CN U8	RS232DRVR		235-00001-200
79	1	SN74ALS04BN U6	HEXINVERTRS		200-00004-200
80	1	SN74LS00N U5	QUAD2-IN'NAND'		202-00000-200
81	1	SN74LS123N U4	DUALONESHOT		202-00123-200
82	2	SN74ALS373N U16,U1	OCTDFLOPS		200-00373-200
83	2	CCF-07 105G R80,R81	2PCMFRES	1MOHM	503-00002-105
84	2	CCF-50 8250F R39,R35	1PCMFRES	825OHM	503-00001-831
85	2	CCF-50 1653F R79,R83	1PCMFRES	165KOHM	503-00001-174

254

NOTES:

1. ITEMS WITH REFERENCE DESIGNATORS IN BRACKETS [] WILL NOT BE POPULATED FOR PRODUCTION.

#10 SCREW P E M
P/N KFH-032-6



DIM	REV -	REV A
A	812"	750"
B	2 125"	2 000"
C	1.45"	1.388"
D	.47"	.408"

DRILL KEY:

- ⊗ 0625"
- 1875"

DRAFTER JG MCKIBBIN		DATE	MICROPROSE GAMES	
CHECKER		DATE	280 LAKEFRONT DRIVE HUNT VALLEY MD 21038	
ENGINEER JG MCKIBBIN		DATE	TITLE	
APPROVAL		DATE	PWR BACKPLANE	
APPROVAL PWR. 5		DATE	SIZE C	DRAWING NUMBER DW-00013A-0008-01
DATE			SHEET OF	

MICROPROSE GAMES, 180 Lakefront Drive, Hunt Valley, Maryland 21030

PROJECT: POWER BACKPLANE DRWG NO: PL-00011A-0008-01 REV:

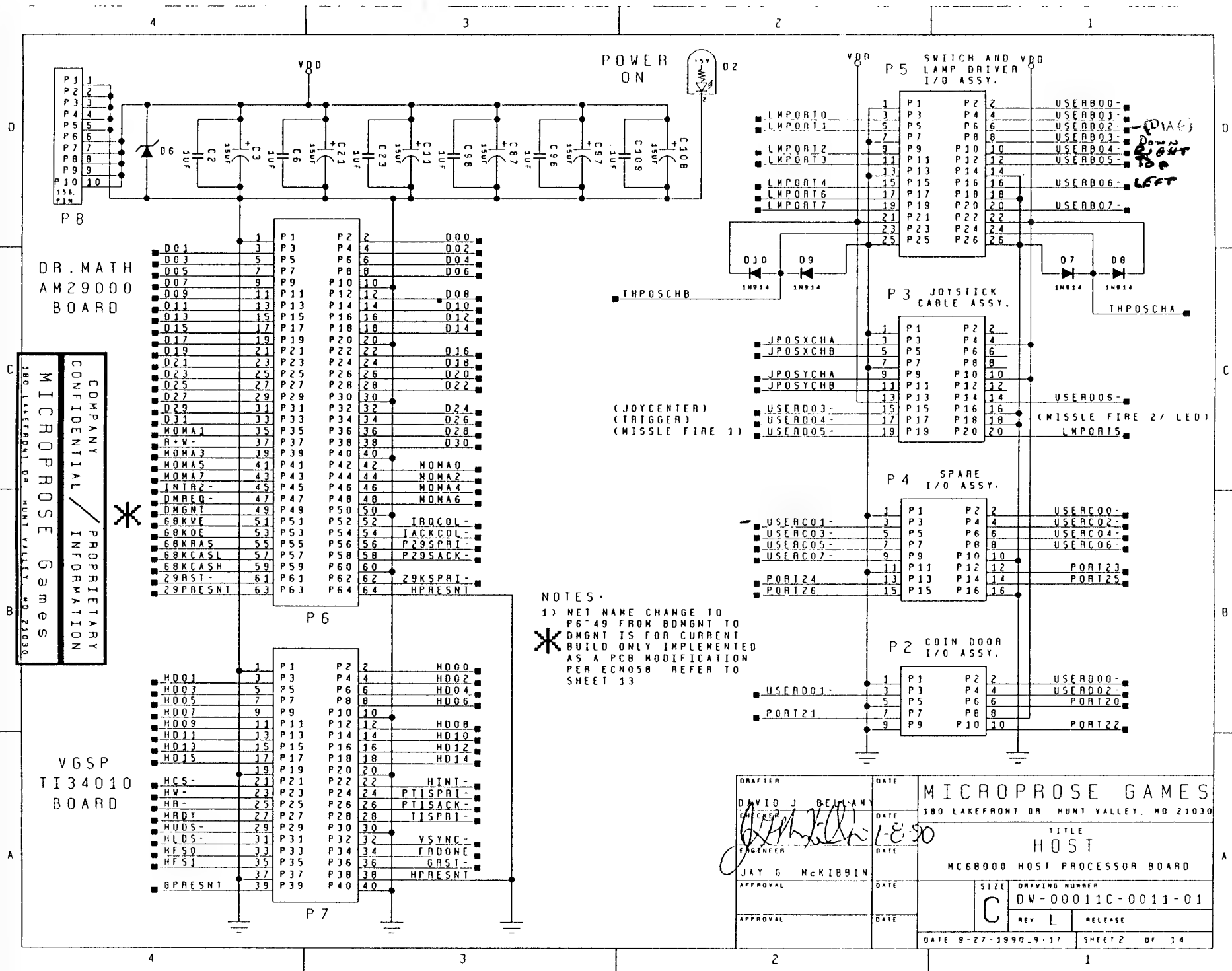
DATE: Tue 15-Jan-1991

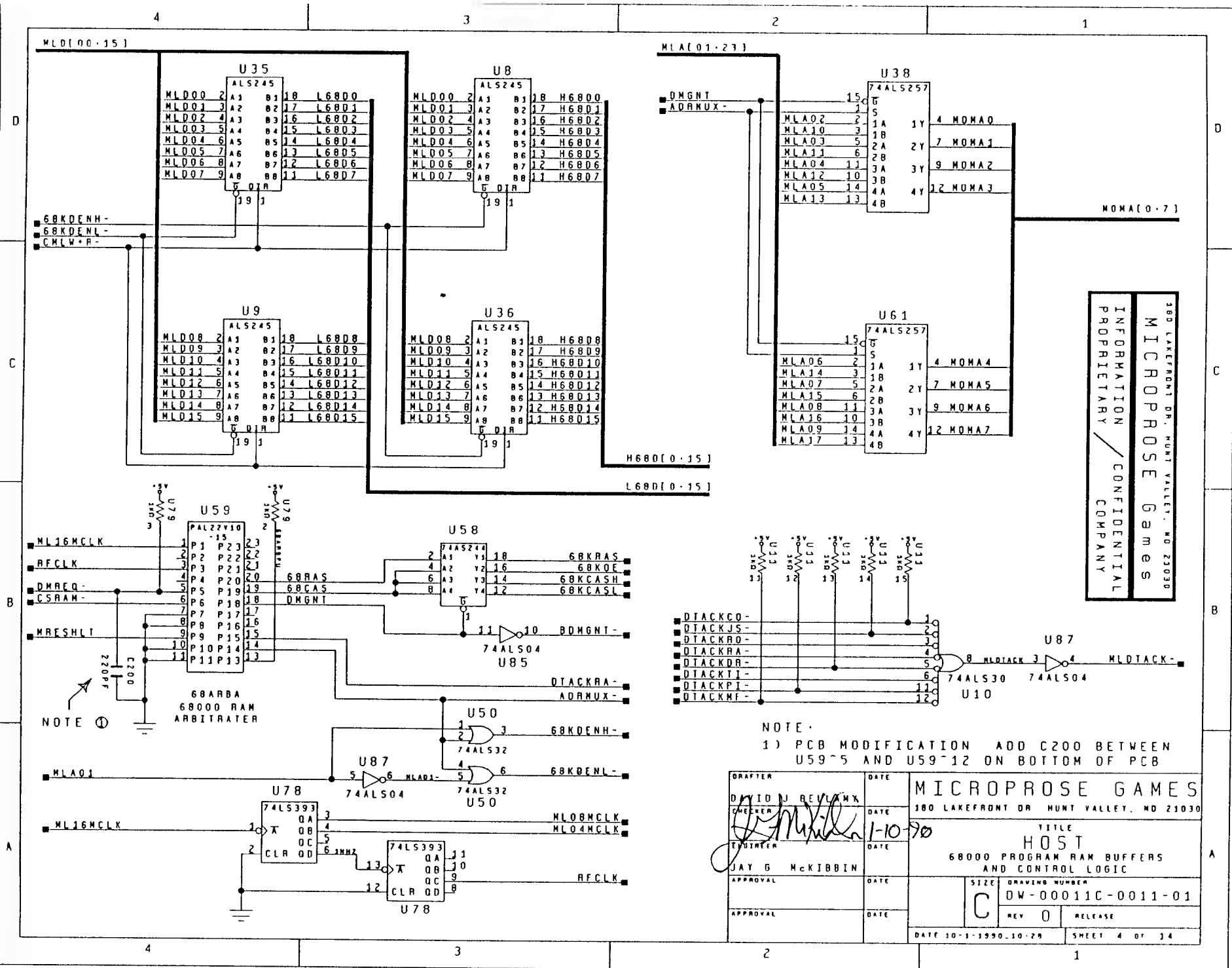
ITEM	QTY	VENDOR	PART NUMBER	PART DESC	VALUE	MPG P/N
		REF.	DES.			
1	3	09-48-2103	J1,J2,J3	1x10FEMCON	.156"	610-10301-010
2	2	KFH-032-6	ST1,ST2	PEM STUDS	#10-32	721-00520-410
3	2		N1,N2	HEXNUTS	#10-32	721-00010-010
4	2		W1,W2	LOCKWASHERS	#10	720-00002-010
5	1	ICTE-5	D1	DIODE	5VDC	300-00001-002

10

HOST PROCESSOR
PRINTED CIRCUIT BOARD ASSEMBLY

DRAWER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY	DATE	180 LAKEFRONT DR HUNT VALLEY, MO 2303	
ENGINEER	DATE	1-14-91	
JAY G McKIBBIN	DATE	TITLE HOST HOST PROCESSOR PCB SCHEMATIC DRAWING	
APPROVAL	DATE	SIZE	DRAWING NUMBER
		C	DW-00011C-0011-01
APPROVAL	DATE	REV P	RELEASE
		DATE 1 14-1991 18 03	SHEET 1 OF 14



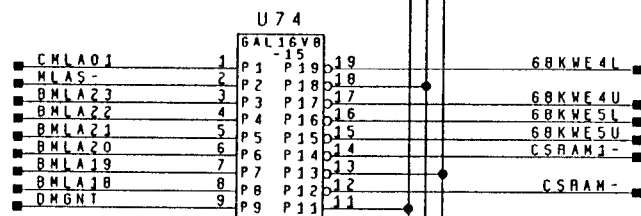


180 LAKEFRONT DR. MOUNT VALLEY, MD 21030
MICROPROSE Games
INFORMATION / CONFIDENTIAL
PROPRIETARY COMPANY

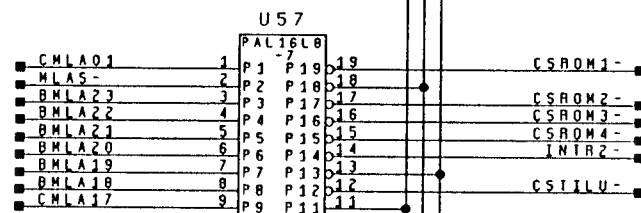
NOTE:
1) PCB MODIFICATION ADD C200 BETWEEN
U59-5 AND U59-12 ON BOTTOM OF PCB

DRAFTER DAVID J. REILLY		DATE 1-10-90		MICROPROSE Games	
CHECKER JAY G. McKIBBIN		DATE		180 LAKEFRONT DR. MOUNT VALLEY, MD 21030	
APPROVAL		DATE		TITLE HOST	
APPROVAL		DATE		68000 PROGRAM RAM BUFFERS AND CONTROL LOGIC	
		DATE 10-1-1990-10-29		SIZE C	
				DRAWING NUMBER DW-00011C-0011-01	
				REV 0	
				RELEASE	
				SHEET 4 OF 14	

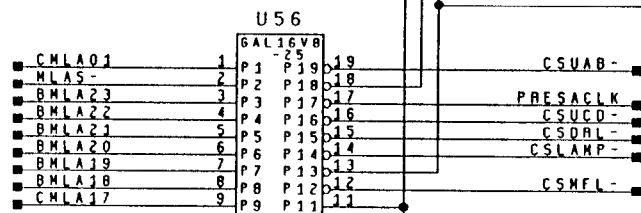
MLDS-
MLUDS-
CMLW+R-



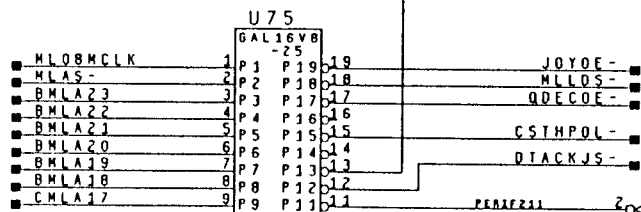
RAMDECA
RAM ADDRESS
DECODER



ROMDECB
ROM ADDRESS
DECODER

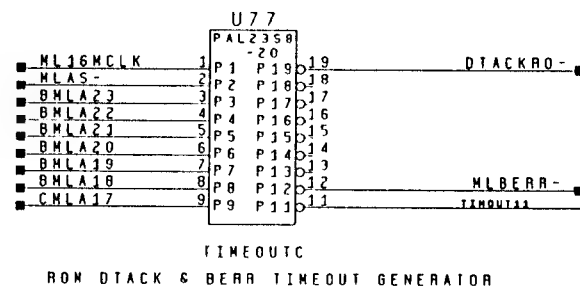


PERIPH1A
PERIPHERAL SET 1
ADDRESS DECODER

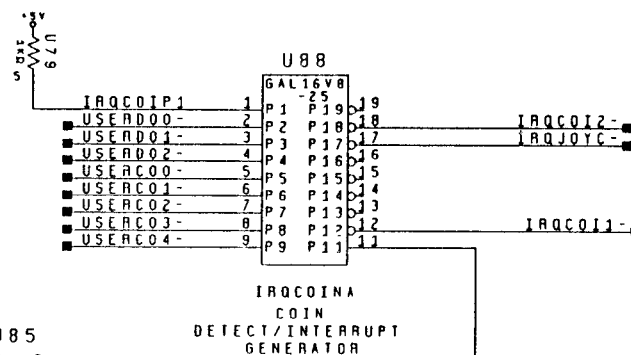
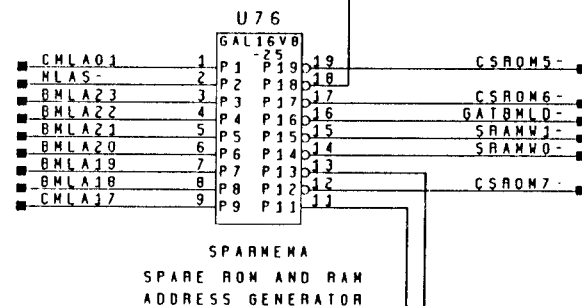


PERIPH2A

PERIPHERAL SET 2 ADDRESS DECODER



74ALS04
U85



U85
74ALS04

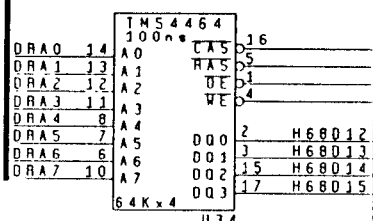
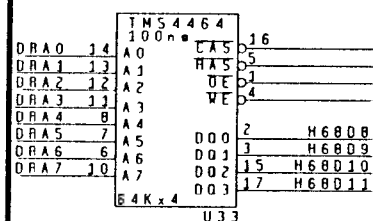
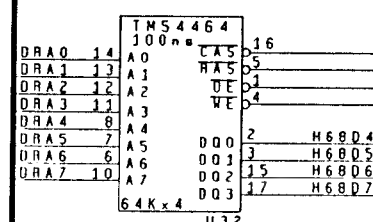
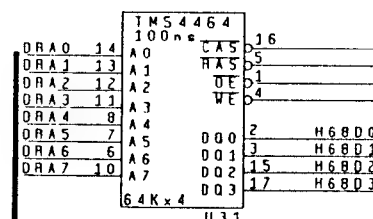
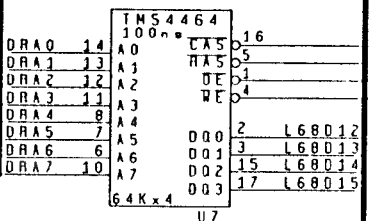
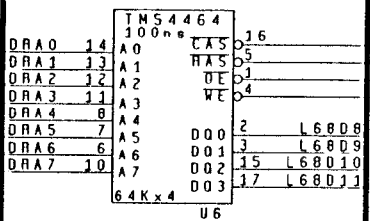
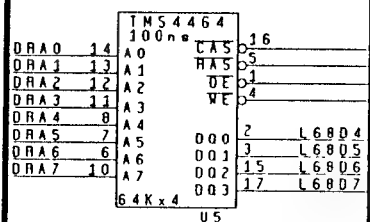
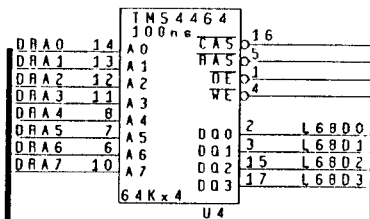
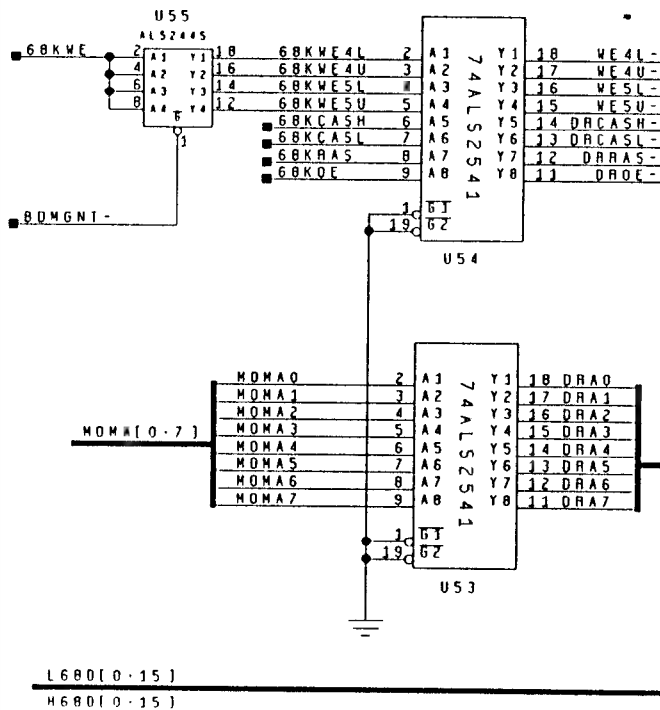
DRAFTER DAVID J. BELLAMY		DATE 1-14-91		MICROPROSE GAMES	
CHECKER [Signature]		DATE		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER JAY G. McKIBBIN		DATE		TITLE HOST	
APPROVAL		DATE		ADDRESS DECODING/ COIN INTERRUPT	
APPROVAL		DATE		DRAWING NUMBER DW-00011C-0011-01	
				REV P RELEASE	
				DATE 10-25-1990-14-42 SHEET 5 OF 14	

COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

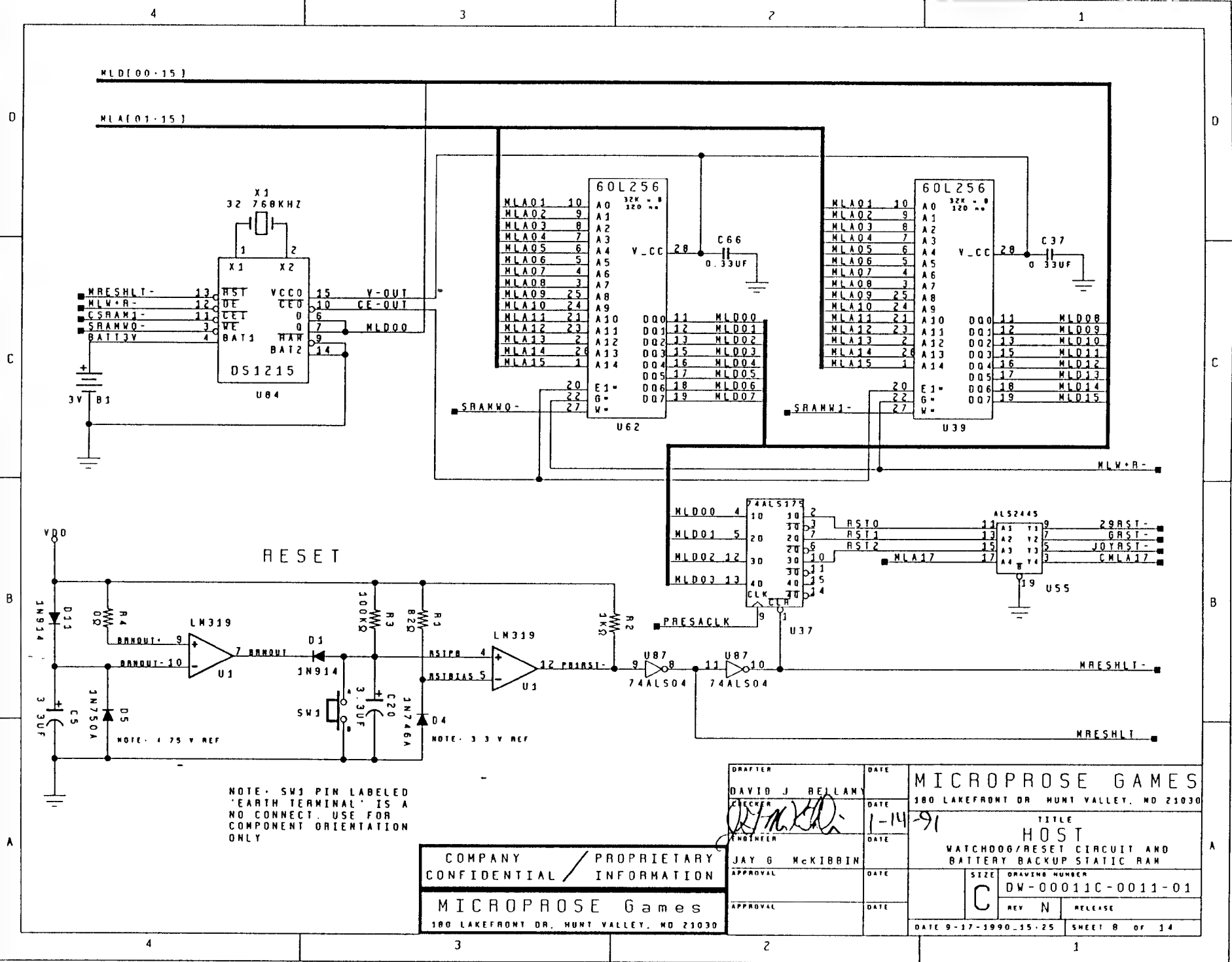
COMPANY / PROPRIETARY
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MICROPROSE Games

180 LAKEFRONT DR. HUNT VALLEY, MD 21030



DRAFTER DAVID J. BECK		DATE 9-26-90		MICROPROSE GAMES 180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
DESIGNER MICHAEL WILLIAMS		DATE		TITLE HOST	
APPROVAL		DATE		SIZE C	
APPROVAL		DATE		DRAWING NUMBER DW-00011C-0011-01	
				REV K	
				RELEASE	
				DATE 5-7-1990 12-47	
				SHEET 6 OF 14	



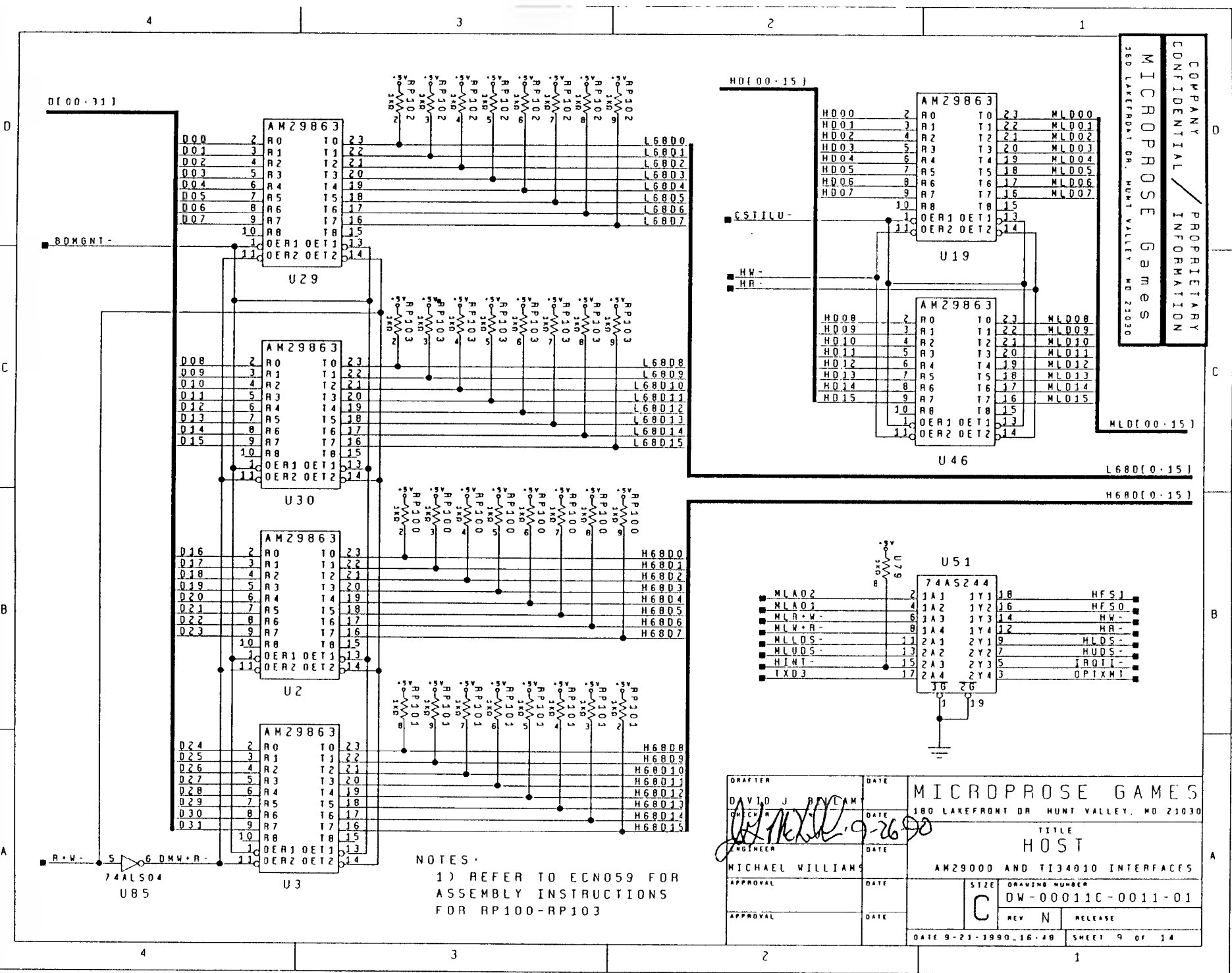
COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE
DAVID J. BELLAMY	
CHECKER	DATE
<i>[Signature]</i>	1-14-91
ENGINEER	DATE
JAY G. McKIBBIN	
APPROVAL	DATE
APPROVAL	DATE

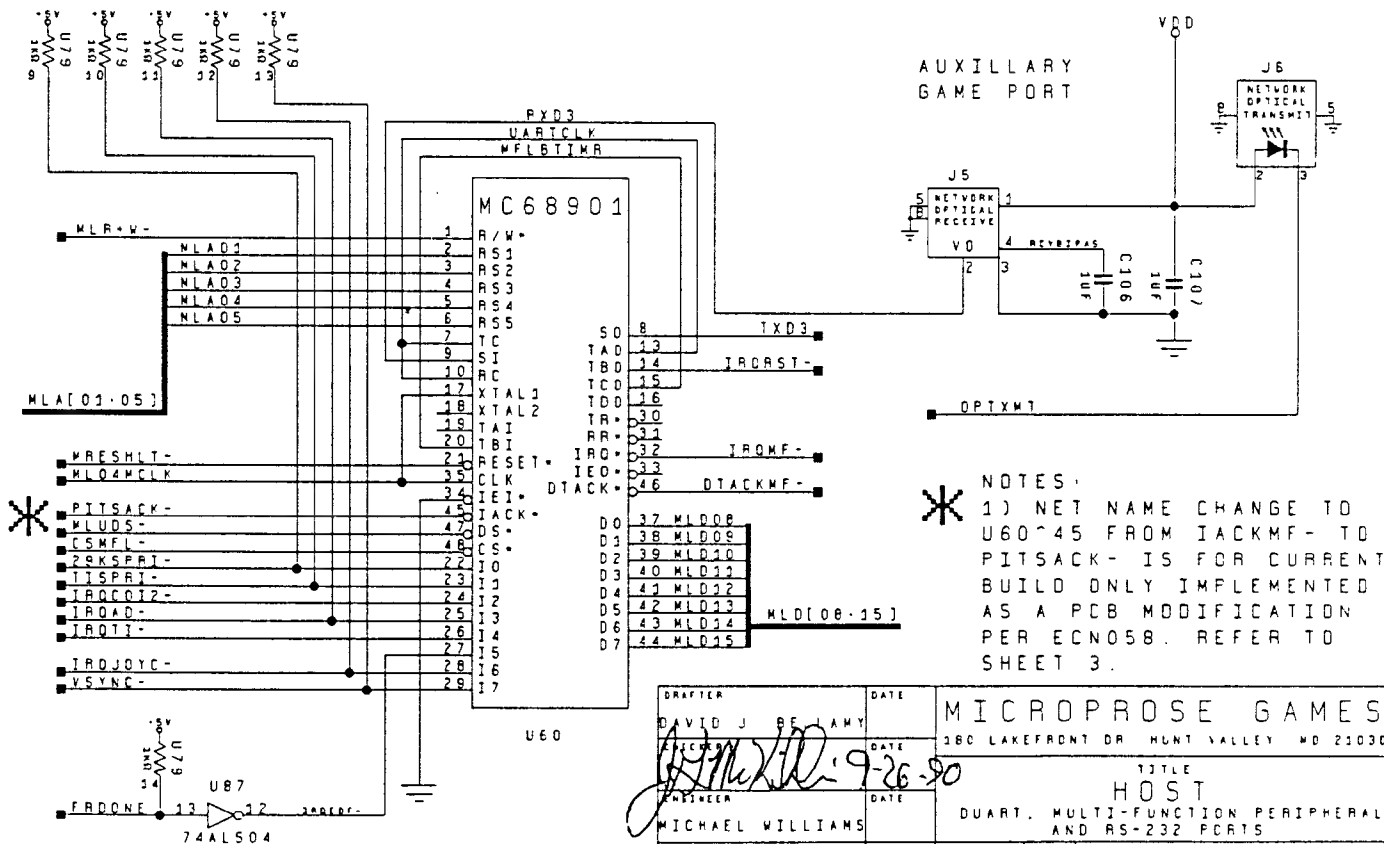
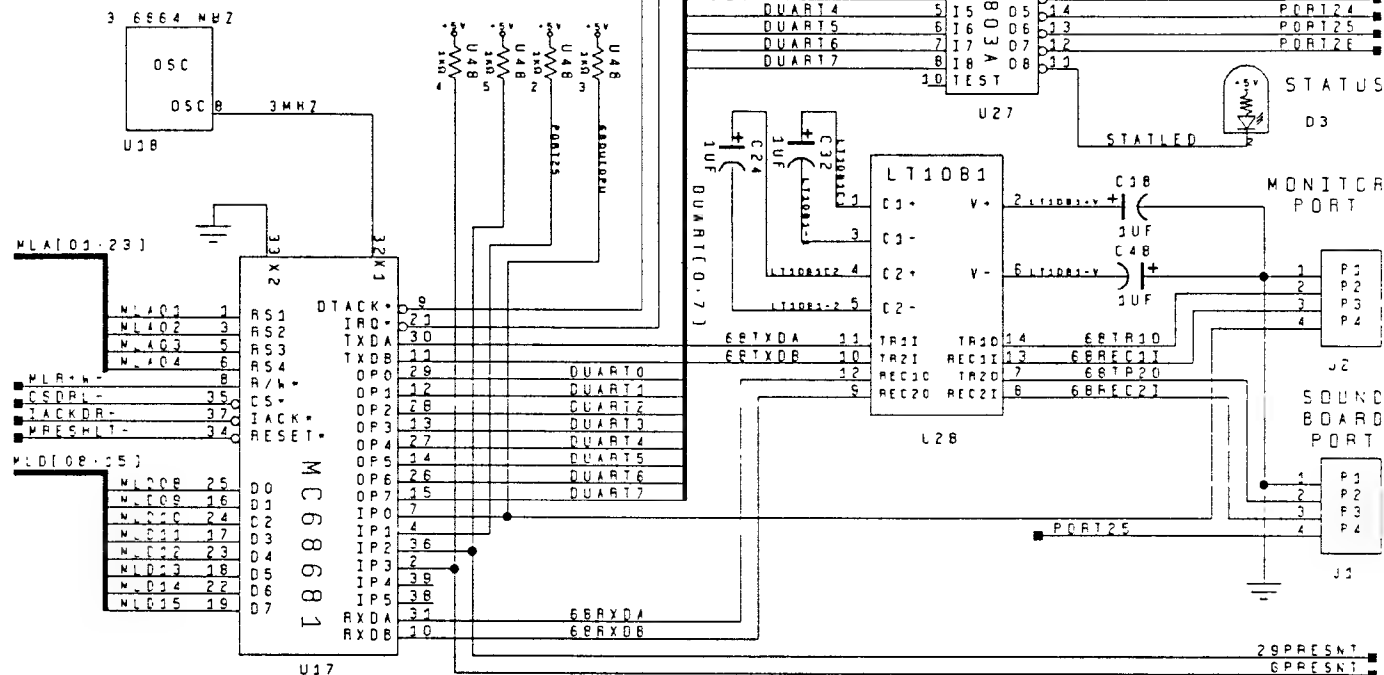
MICROPROSE GAMES	
180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
TITLE	
HOST	
WATCHDOG/RESET CIRCUIT AND BATTERY BACKUP STATIC RAM	
SIZE	DRAWING NUMBER
C	DW-00011C-0011-01
REV N	RELEASE
DATE 9-17-1990-15-25	SHEET 8 OF 14

COMPANY
CONFIDENTIAL / PROPRIETARY INFORMATION
MICROPROSE Games
380 LAKEFRONT DR. HUNT VALLEY, MD 21030



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MICROPROSE Games
380 LAKEFRONT DR. HUNT VALLEY MD 21030



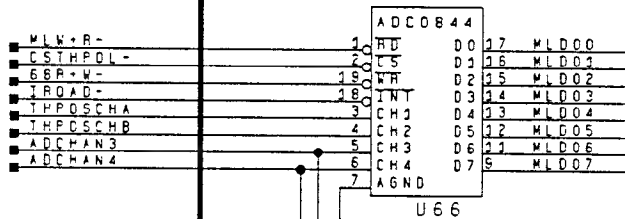
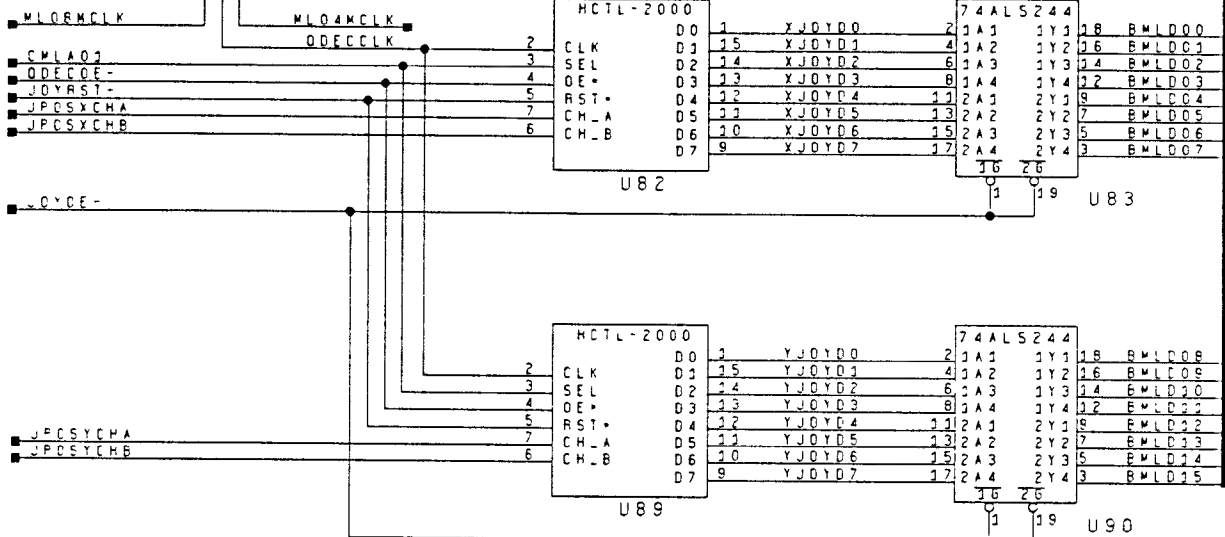
NOTES:

1) NET NAME CHANGE TO U60-45 FROM IACKMF- TO PITSACK- IS FOR CURRENT BUILD ONLY IMPLEMENTED AS A PCB MODIFICATION PER ECN058. REFER TO SHEET 3.

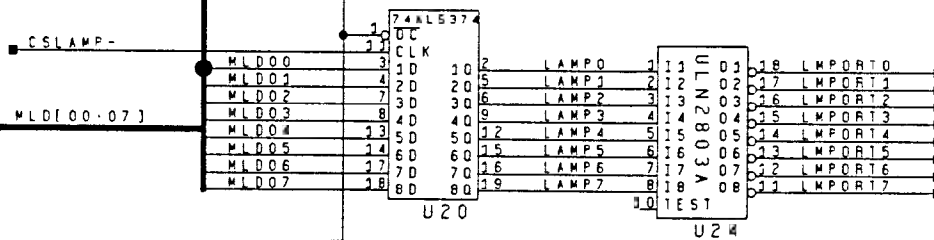
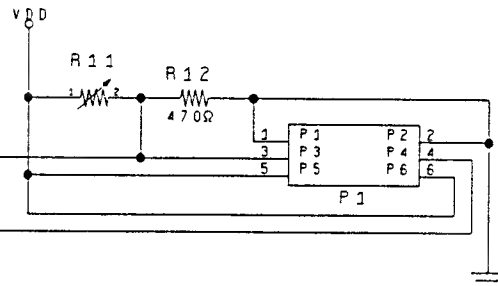
DRAFTER DAVID J. BELAMY		DATE 9-26-90		MICROPROSE GAMES 380 LAKEFRONT DR. HUNT VALLEY MD 21030	
DESIGNER MICHAEL WILLIAMS		DATE		TITLE HOST DUART. MULTI-FUNCTION PERIPHERAL AND RS-232 PCRTS	
APPROVAL		DATE		SIZE C	
APPROVAL		DATE		DRAWING NUMBER DW-00011C-0011-01	
				REV M RELEASE	
				DATE 9-23-1990.17-09 SHEET 10 OF 14	

MLD[00:15]

NOTE ①
J4



R11 THERMISTOR
70° F = 595Ω
120° F = 185.1Ω



NOTE:
1) REF ECN059. INSTALL
WIRE STAPLE BETWEEN
J4-2 AND J4-3

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MICROPROSE Games
380 LAKEFRONT DR. HUNT VALLEY, MD 21030

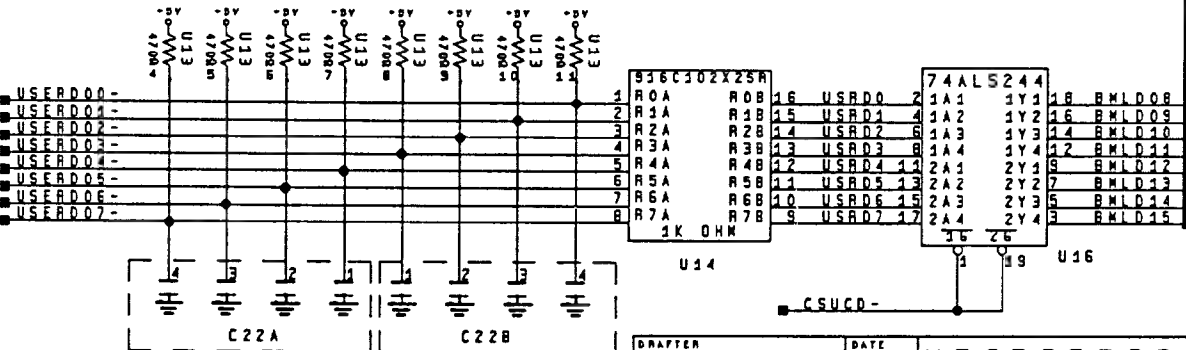
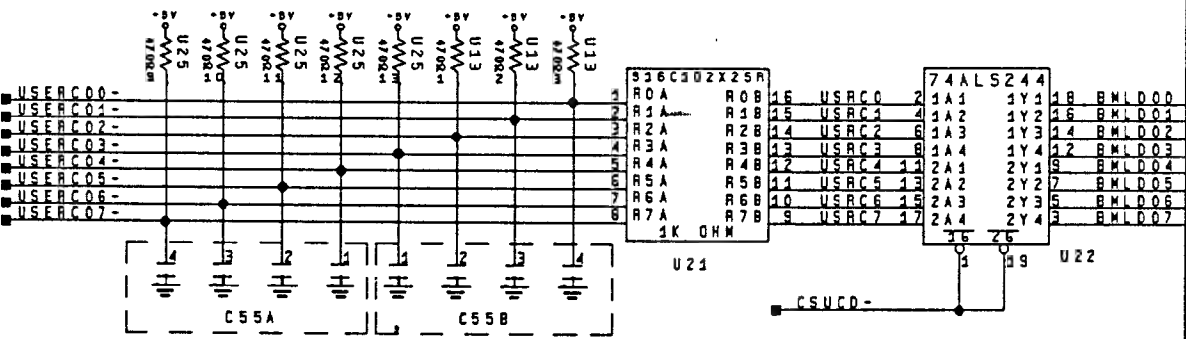
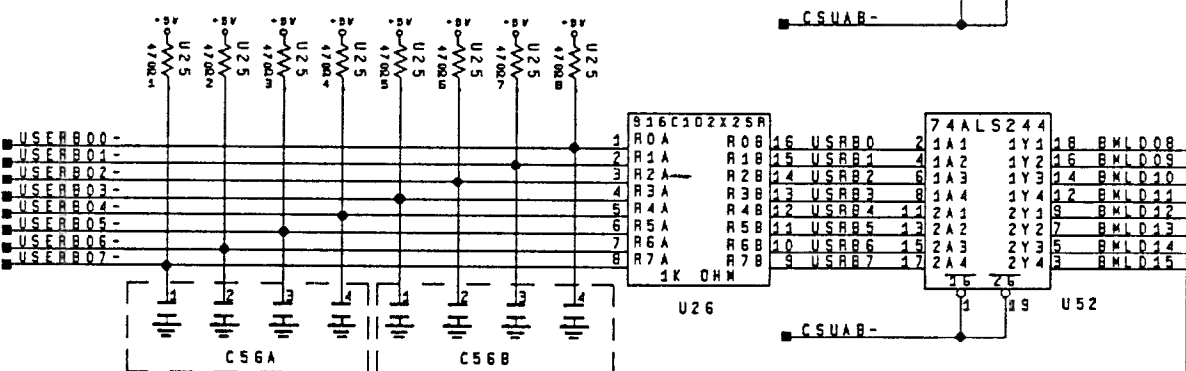
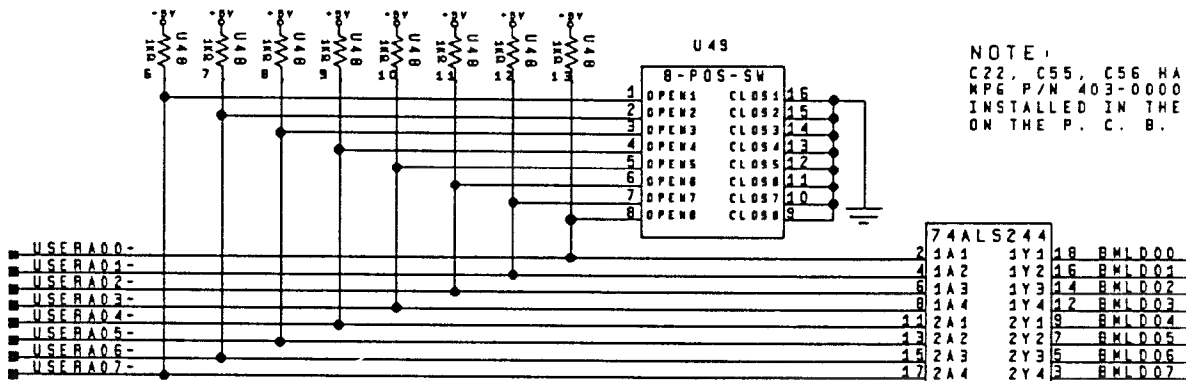
DRAFTER DAVID J. BELMONT		DATE 9-26-90		MICROPROSE GAMES 380 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER MICHAEL WILLIAMS		DATE		TITLE HOST	
APPROVAL		DATE		10 INTERFACE AND LAMP DRIVERS	
APPROVAL		DATE		SIZE C	
				DRAWING NUMBER DW-00011C-0011-C1	
				REV N RELEASE	
				DATE 9-23-1990 17:38 SHEET 13 OF 14	

D

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1



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MICROPROSE Games

180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER
DAVID J. BELLAMY

DATE
5/1/90

ENGINEER
MICHAEL WILLIAMS

APPROVAL

APPROVAL

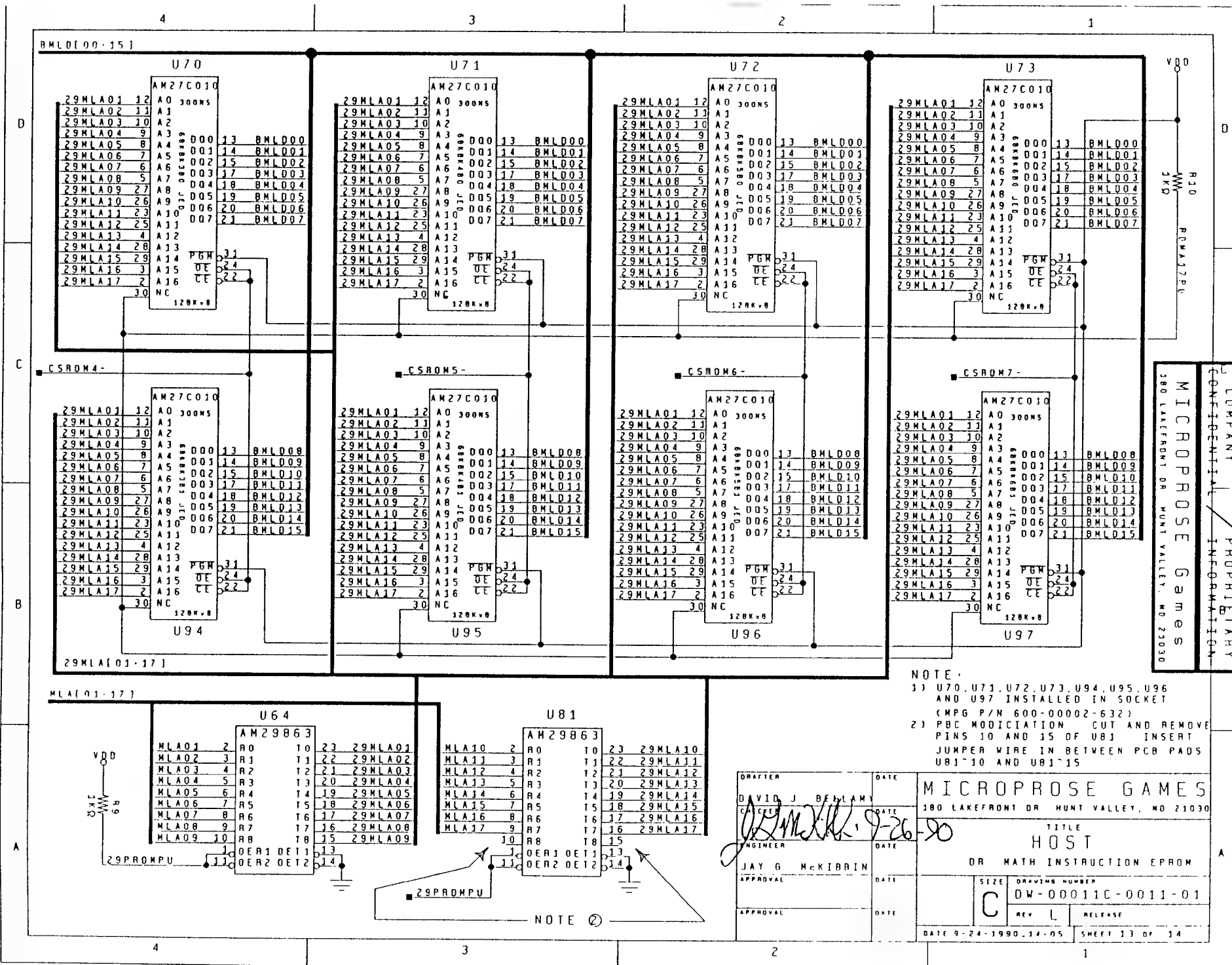
MICROPROSE GAMES
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

TITLE
HOST
USER SWITCH INPUT INTERFACE

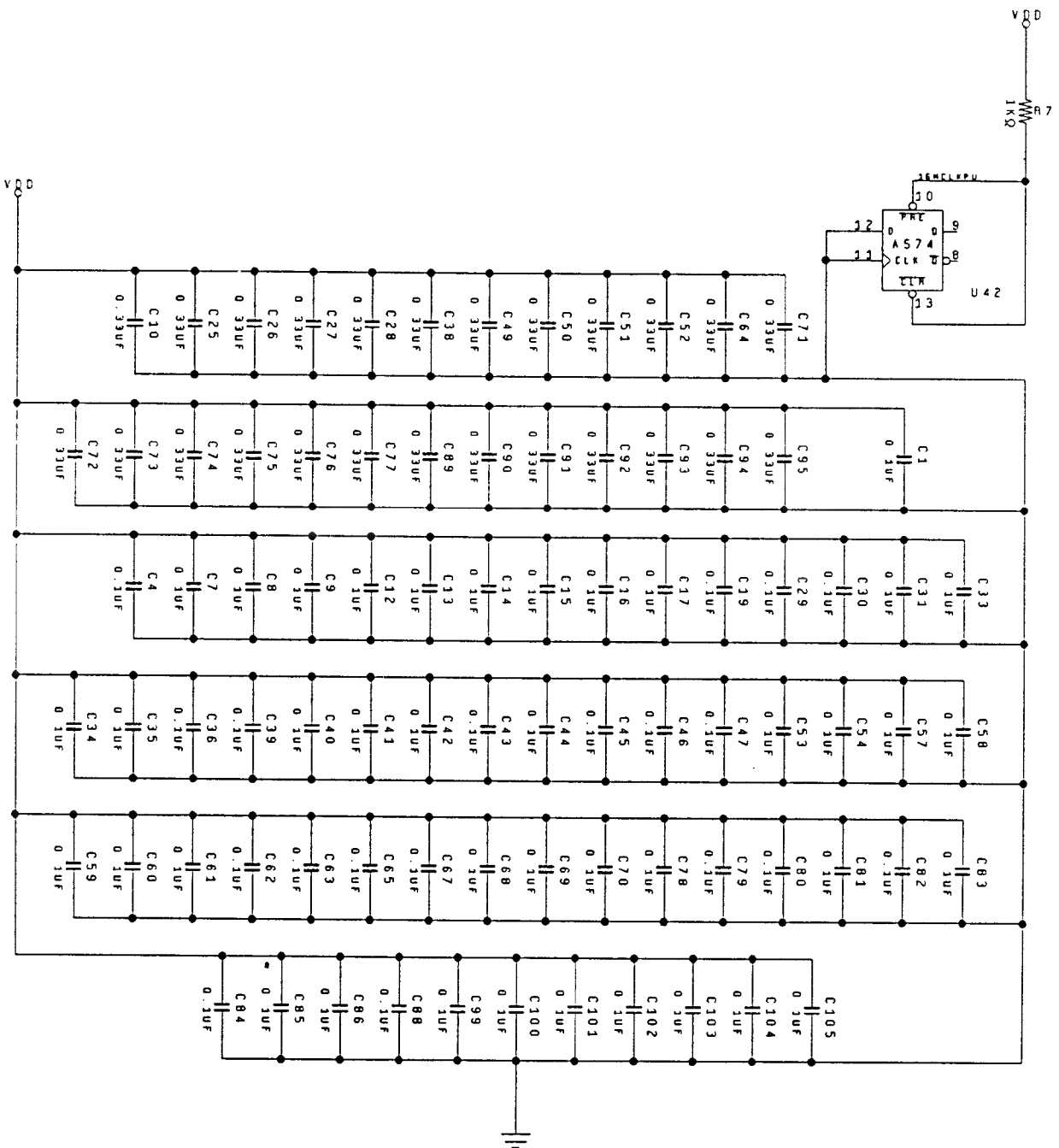
DW-00011C-0011-01

REV H RELEASE

DATE 5-1-1990-13-30 SHEET 12 OF 14



DRAFTER DAVID J. BENJAMIN		DATE 9-26-90	
CHECKED JAY G. McKIRKIN		DATE	
APPROVAL		DATE	
APPROVAL		DATE	
MICROPROSE GAMES			
180 LAKEFRONT DR HUNT VALLEY, MD 21030			
TITLE HOST			
OR MATH INSTRUCTION EPROM			
SIZE C		DRAWING NUMBER DW-00011C-0011-01	
REV L		RELEASE	
DATE 9-24-1990-14-05		SHEET 13 OF 14	



COMPANY PROPRIETARY
CONFIDENTIAL / INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELL		DATE 1-14-91		MICROPROSE GAMES 180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER <i>[Signature]</i>		DATE 1-14-91		TITLE HOST POWER DECOUPLING	
ENGINEER JAY G. McKIBBIN		DATE		SIZE C	
APPROVAL		DATE		DRAWING NUMBER DW-00011C-0011-01	
APPROVAL		DATE		REV D RELEASE	
				DATE 3-22-1990-37-38 SHEET 14 OF 14	

BILL OF MATERIALS

HOST PROCESSOR P.C.B.

ASSEMBLY: A10-00001-001

DATE	ECN	REV	SHEET NUMBER																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	ECN	A	A					A	A																		
	ECN	B	B				B																				
	ECN	C	C						C																		
3-21-90	ECN	D	D	D	D	D	D	D	D																		
5-01-90	ECN017	E	E						E																		
5-01-90	ECN018	F	F		F																						
5-01-90	ECN020	G	G	G																							
5-01-90	ECN021	H	H		H																						
5-07-90	ECN016	K	K			K																					
9-11-90	ECN059	L	L		L	L	L	L	L																		
5-07-90	ECN080	M	M					M																			
9-21-90	ECN089	N	N		N																						
9-21-90	ECN109	O	O						O																		
10-08-90	ECN113	P	P					P																			
10-23-90	ECN122	R	R			R			R																		
10-25-90	ECN123	S	S					S																			
1-08-91	ECN150	T	T				T		T																		

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MICROPROSE Games
 180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY	DATE
CHECKED <i>[Signature]</i>	DATE 1-14-91
ENGINEER JAY G. McKIBBIN	DATE
APPROVAL	DATE
APPROVAL	DATE

MICROPROSE GAMES	
180 LAKEFRONT DRIVE, HUNT VALLEY, MD 21030	
TITLE	DWG NO
BILL OF MATERIALS	PL-00011A-0011-01
HOST PROC. P.C.B.	REV T
A10-00001-001	DATE 1-14-1991-11-29
	SHEET 1 OF 7

A

MICROPROSE GAMES, 180Lakefront Drive, Hunt Valley, Maryland 21030
 PROJECT NAME: HOST PROCESSOR DRWG. NO.: PL-00011A-0011-01 REV: T
 DATE: Wed 5-Oct-1990

ITEM	QTY	PART NUMBER REF. DES.	PART DESCRIP	VALUE	MPG P/N
1	2	914C471X2PE U13,U25	PULRESPAK	470OHM	501-00022-471
2	1	90B08S U49	8POSDIPSW		625-00001-208
3	3	916C102X2SR U14,U21,U26	ISORESPAK	1K	501-00031-102
4	6	929CZ5U104Z050B C22A,C22B,C55A,C55B,C56A,C56B	DIPCAPx4	.1 UF	403-00003-104
5	1	SN74ALS374N U20	OCTALDFLOPS		200-00374-200
6	7	SN74ALS244AN U16,U22,U23,U52,U55,U83,U90	OCTBUFFR		200-00244-200
7	1	ADC0844CCN U66	A/DCONVERTR		246-00001-200
8	2	HCTL-2000 U82,U89	QUADDECODER		246-00002-200
9	2	ULN2803A U24,U27	LAMPDRIVER		279-00001-200
10	67	C410C104M5U5CA C4,C1,C33,C7,C8,C14,C13,C12,C9,C31,C30,C29,C19,C17,C15, C16,C45,C44,C46,C47,C53,C54,C57,C58,C40,C41,C42,C43,C39, C36,C34,C35,C70,C69,C78,C79,C80,C81,C82,C83,C63,C65,C67, C68,C62,C61,C59,C60,C85,C84,C86,C88,C102,C101,C100,C99, C105,C103,C104,C107,C106,C109,C96,C98,C23,C6,C2	AXCERCAP	0.1UF	402-00382-104
11	[0]	68001-503 [J4]	3PINJUMPR	.100"	610-00002-003
12	0	92915-R-HS-1 J5	FIBROPTRCV		240-00004-001
13	0	92915-T-DD J6	FIBROPTXMT		240-00005-001
14	1	X0-53B-3.6864 U18	DIPOSCILATR	3.6864M	290-00002-003
15	* 1	MC68681-P U17	DUART		240-00003-200
16	1	LT1081CN U28	RS232DRVR		235-00001-200

ITEM	QTY	PART NUMBER REF. DES.	PART DESCRIP	VALUE	MPG P/N
17	4	173D105X0035V C18,C24,C32,C48	AXTANTCAP	1UF	422-00072-105
18 D*	1	MC68901-P U60	MFPERIPHERL		130-68901-204
19	8	AM29C863PC U2,U3,U19,U29,U30,U46,U64,U81	9BIBUSDRVR		235-00005-200
20	2	22-05-7048 J1,J2	MOLEX4PIN	.100"	610-00601-004
21	5	1N914 D1,D7,D8,D9,D10,D11	DIODE		300-00002-003
22	5	CCF-07 102G R2,R7,R8,R9,R10	2%MFRES	1K	503-00002-102
23	2	173D335X0020V C5,C20	AXTANTCAP	3.3UF	422-00062-335
24	1	SA101A221JAA C200	AXCERCAP	220PF	402-00195-221
25	1	CCF-07 104G R3	2%MFRES	100K	503-00002-104
26	1	1N746A D4	ZENER		301-00002-033
27	1	WX-32.768KHZ X1	CRYSTAL	32KHZ	290-00004-32K
28	1	KSA1A211 SW1	PBSWITCH		625-00002-001
29	1	LM319N U1	VOLTCOMPAR	14DIP	280-00003-200
30	1	DS1215 U84	R/TCLK		291-01215-200
31	27	C412C334M5U5CA C52,C51,C50,C49,C38,C28,C27,C26,C25,C10,C91,C90,C72,C73, C74,C75,C89,C77,C76,C95,C94,C93,C92,C64,C71,C37,C66	AXCERCAP	0.33UF	402-00382-334
32	1	15-51-04-410-000 B1	LITHBATT	3VOLT	390-00001-001
33 *	2	MCM60L256AP12 U39,U62	32Kx8SRAM	120NS	221-00003-212
34	1	SN74ALS175N U37	QUADDFLOPS		200-00175-200

2-14-1

ITEM	QTY	PART NUMBER REF. DES.	PART DESCRIP	VALUE	MPG P/N
35					
36	2	SN74ALS2541N U53, U54	OCTINVDRVR		200-02541-200
37	* 8	TMS4464-10NL U4, U5, U6, U7, U31, U32, U33, U34	64Kx4DRAM	100NS	220-00001-210
38	A 1	AMPAL23S8-20PC U77	TIMEOUTC	25NS	<u>120-00001-206</u>
39	A 1	GAL16V8A-25P U75	PERIPH2A	25NS	120-00001-005
40	A 1	GAL16V8A-25P U15	VPA_GENA	25NS	120-00001-000
41	A 1	GAL16V8A-25P U74	RAMDECA	15NS	120-00001-002
42	B 1	GAL22V10-15P U59	68ARBA	15NS	120-00001-001
43	1	1N750A D5	ZENER		301-00002-047
44	1	SN74LS393N U78	QUADCOUNTR		202-00393-200
45	1	SN74ALS30AN U10	8INNAND		200-00030-200
46	1	SN74ALS32N U50	QUAD2INOR		200-00032-200
47	2	SN74ALS257N U38, U61	2:1MUX		200-00257-200
48	4	SN74ALS245AN U8, U9, U35, U36	OCTBIDBUFR		200-00245-200
49	1	SN74LS148N U12	8:3ENCODER		202-00148-200
50	1	SN74ALS138N U47	3:8DEMUX		200-00138-200
51	1	68001-502 J3	2PINJUMP	.100"	610-00002-002
52	1	X0-43D-32 U43	DIPOSCILATR	32MHZ	290-00001-032
53	1	SN74AS74N U42	DUALDFLOPS		201-00074-200

ITEM	QTY	PART NUMBER REF. DES.	PART DESCRIP	VALUE	MPG P/N
54	7	SN74AS244N U44,U45,U51,U58,U63,U65,U80	OCTBUFFR		201-00244-200
55	1	SN74AS1004AN U41	HEXINERTR		201-01004-200
56	1	SN74ALS11AN U86	TRI3INAND		200-00011-200
57	2	SN74ALS04BN U85,U87	HEXINVERTR		200-00004-200
58	1	CCF-07 180G R6	2%MFRES	18OHM	503-00002-180
59	3	916C102X2PE U11,U48,U79	PULLRESPAK	1KOHM	501-00032-102
60 E*	1	MC68000-P12F U40	MICROPROCESR	16MHZ	135-68000-216
61	2	HLMP3600 D2,D3	LEDW/RES	RED	305-00003-002
62	6	173D156X0015W C3,C11,C21,C87,C97,C108	AXTANTCAP	15UF	422-00052-156
63	1	ICTE-5 D6	ZENER	5V	300-00001-002
64	1	71922-016 P4	2x8HEADER	.100"	610-00800-016
65	1	71922-020 P3	2x10HEADER	.100"	610-00800-020
66	1	71922-026 P5	2x13HEADER	.100"	610-00800-026
67	1	26-60-5100 P8	MOLEX10PIN	.156"	610-00601-010
68	1	71922-140 P7	2x20HEADER	.100"	610-00900-040
69	1	533249-1 P6	2x32HEADER	.100"	6 - -064
70					
71 A	1	GAL16V8A-25P U76	SPARMEMA	25NS	120-00001-007

ITEM	QTY	PART NUMBER REF. DES.	PART DESCRIP	VALUE	MPG P/N
72	A 1	GAL16V8A-25P U56	PERIPH1A	25NS	120-00001-004
73	A 1	TIBPAL16L8-7CN U57	ROMDECB	7.5NS	120-00001-103
74	A 1	GAL16V8A-25P U88	IRQCOINA	25NS	120-00001-008
75	1	71922-006 P1	2x3HEADER	.100"	610-00800-006
76	1	71922-010 P2	2x5HEADER	.100"	610-00800-010
77	1	68786-102 J3	SHUNT		715-00001-001
78	[0]	SRS8-12-01	SPACER	.75 "	700-00001-003
79	5	7-0805G-5 TP1,TP2,TP3,TP4,TP5	TEST PIN		710-00001-001
80	1	7-22870-5 TP6	TEST PIN		710-00001-002
81	C* 1	AM27C010-305DC U67	128Kx8EPROM 68KBK0B0.001	300NS	110-00001-100
82	C* 1	AM27C010-305DC U91	128Kx8EPROM 68KBK0B1.001	300NS	110-00001-101
83	C* 1	AM27C010-305DC U68	128Kx8EPROM 68KBK1B0.001	300NS	110-00001-102
84	C* 1	AM27C010-305DC U92	128Kx8EPROM 68KBK1B1.001	300NS	110-00001-103
85	C* 1	AM27C010-305DC U69	128Kx8EPROM 68KBK2B0	300NS	110-00001-004
86	C* 1	AM27C010-305DC U93	128Kx8EPROM 68KBK2B1	300NS	110-00001-005
87	C* 1	AM27C010-305DC U70	128Kx8EPROM 68KBK3B0	300NS	110-00001-006
88	C* 1	AM27C010-305DC U94	128Kx8EPROM 68KBK3B1	300NS	110-00001-007
89	C* 1	AM27C010-305DC U71	128Kx8EPROM 68KBK4B0	300NS	110-00001-008
90	C* 1	AM27C010-305DC U95	128Kx8EPROM 68KBK4B1	300NS	110-00001-009

ITEM	QTY	PART NUMBER REF. DES.	PART DESCRIP	VALUE	MPG P/N
91	C*	[0] AM27C010-305DC [U72]	128Kx8EPROM 68KBK5B0	300NS	110-00001-010
92	C*	[0] AM27C010-305DC [U96]	128Kx8EPROM 68KBK5B1	300NS	110-00001-011
93	C*	[0] AM27C010-305DC [U73]	128Kx8EPROM 68KBK6B0	300NS	110-00001-012
94	C*	[0] AM27C010-305DC [U97]	128Kx8EPROM 68KBK6B1	300NS	110-00001-013
95	A	2 ICO-320MTT UX77,UX88 [UX15,UX56,UX57,UX74,UX75,UX76]	SOCKET		600-00001-320
96	B	[0] ICO-324MTT [UX59]	SOCKET		600-00001-324
97	C	10 2-644018-2 UX67,UX68,UX69,UX70,UX71,UX91,UX92,UX93,UX94,UX95, [UX72,UX73,UX96,UX97]	SOCKET		600-00002-632
98	D	[0] 1848-AG111D [UX60]	SOCKET		600-00001-648
99	E	1 110-91-964-41-001 UX40	SOCKET		600-00001-964
100		1 RL2003-289-95-D1 R11	TEMPSENSOR	500OHM	508-00001-501
101		1 CCF-07 471G R12	2PCMFRES	470OHM	503-00002-471
102		1 CCF-07 820G R1	2PCMFRES	82 OHM	503-00002-820
103		1 FRJ-50 R4	JUMPRES	0 OHM	503-00001-000
104		4 CSC09A01102G RP100,RP101,RP102,RP103	8RESSIPPAK	1 KOHM	501-10008-102

270					

NOTES:

- (1) PARTS REQUIRING 0.33UF DECOUPLING CAPS ARE MARKED (*) IN BETWEEN ITEM NO. AND QTY. COLUMNS.
- (2) PARTS REQUIRING SOCKETS ARE MARKED WITH A LETTER TO CORRESPOND WITH SOCKETS WITH THE SAME LETTER.
- (3) PARTS WITH REFERENCE DESIGNATORS IN BRACKETS [] ARE WILL NOT BE POPULATED DURING PRODUCTION.

DR. MATH P.C.B. ASSEMBLY

COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION

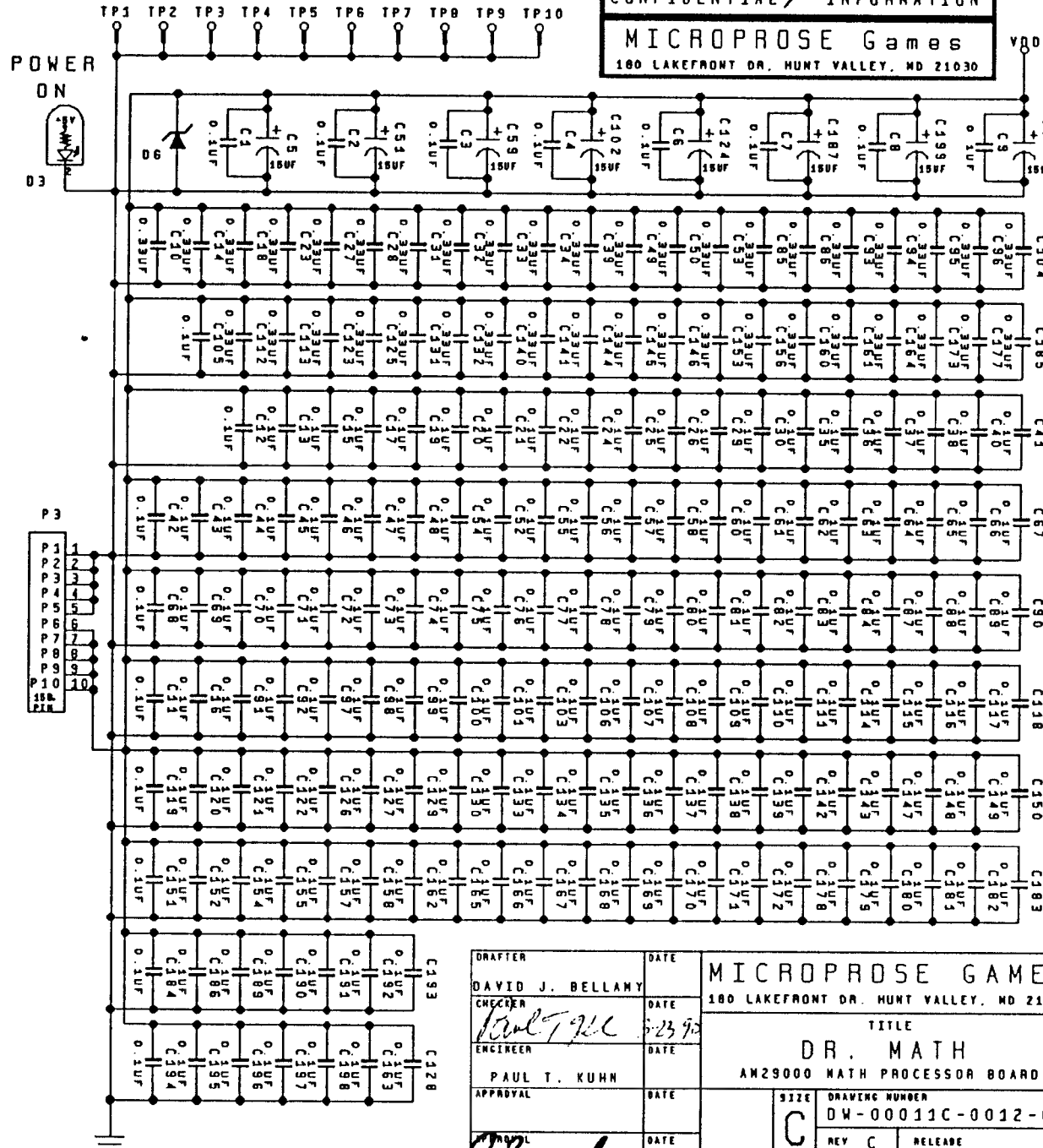
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J BELLAMY	DATE 11-8-90	MICROPROSE GAMES 180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER <i>Paul T. Kuhn</i> ENGINEER	DATE 11-8-90	TITLE DR. MATH DR MATH PCB ASSEMBLY	
PAUL T KUHN		SIZE C	DRAWING NUMBER DW-00011C-0012-01
APPROVAL	DATE	REV M	RELEASE
APPROVAL	DATE	DATE 11-8-1990-10-54 SHEET 3 OF 28	

M68000 BOARD

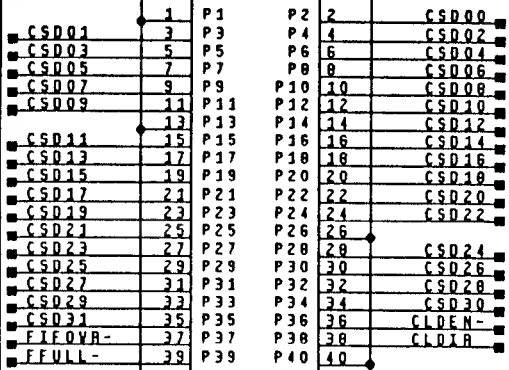
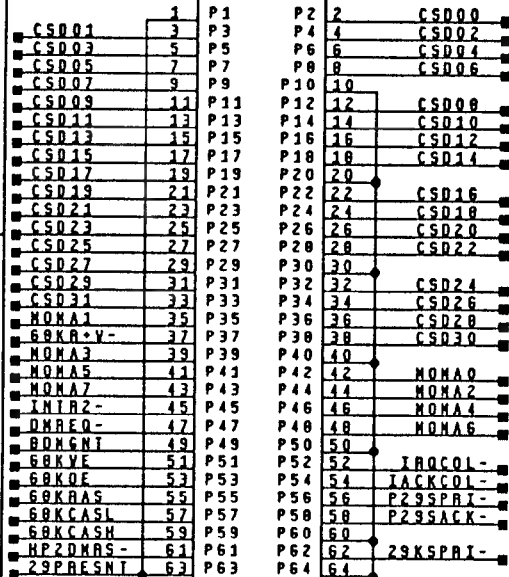
COMPANY PROPRIETARY
CONFIDENTIAL INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030



DRAFTER DAVID J. BELLAMY		DATE 6-23-90	
CHECKER Paul T. Kuhn		DATE	
ENGINEER PAUL T. KUHN		DATE	
APPROVAL [Signature]		DATE	
MICROPROSE GAMES 180 LAKEFRONT DR. HUNT VALLEY, MD 21030 TITLE DR. MATH AM29000 MATH PROCESSOR BOARD			
SIZE C		DRAWING NUMBER DW-00011C-0012-01	
REV C		RELEASE	
DATE 3-21-1990-20:40		SHEET 2 OF 28	

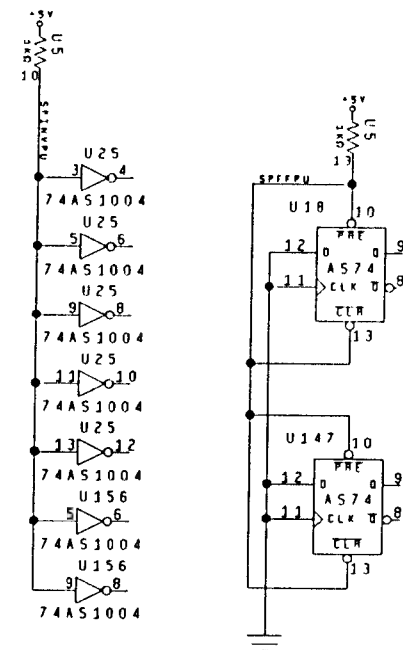
TI34010 BOARD



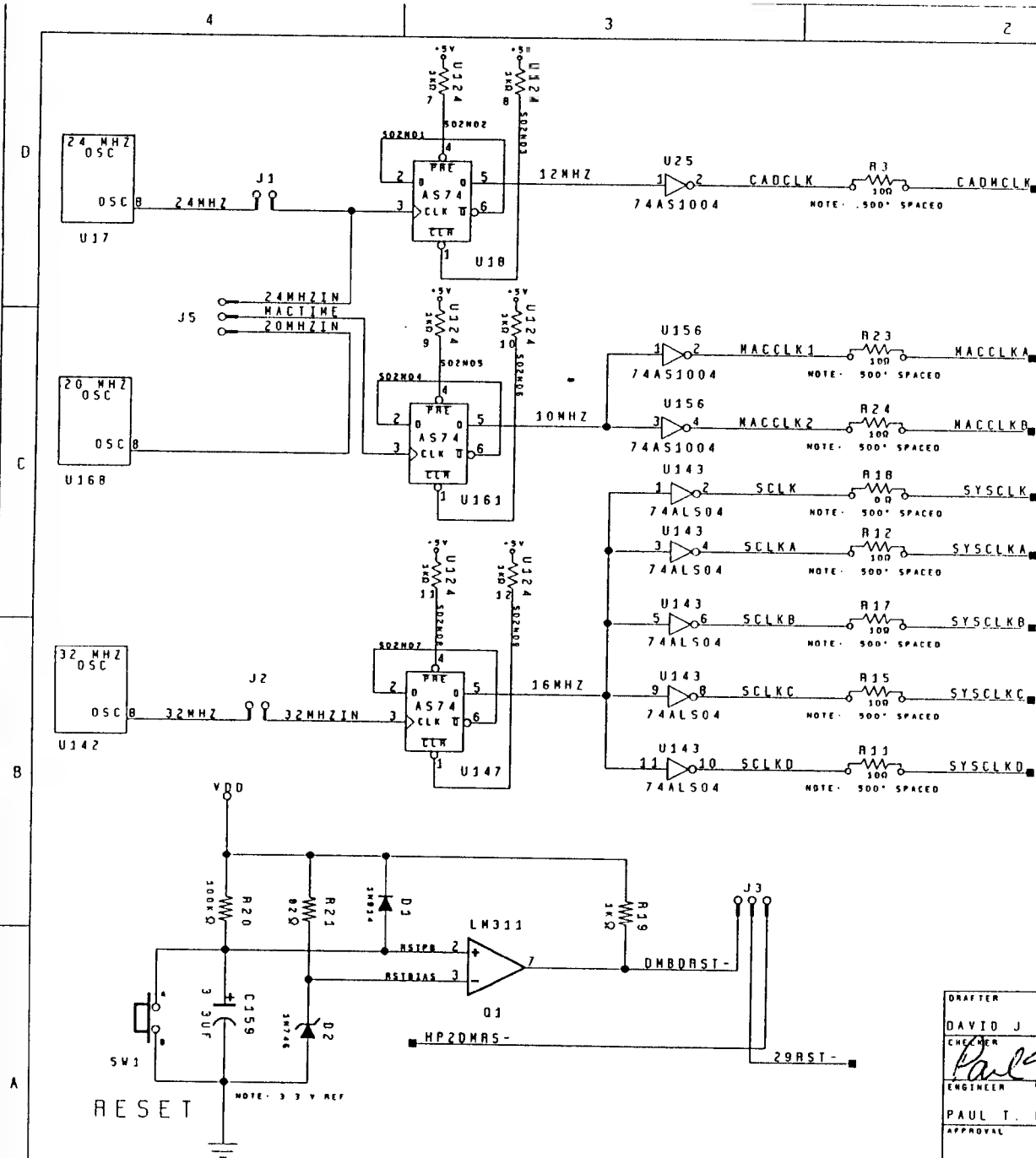
COMPANY PROPRIETARY
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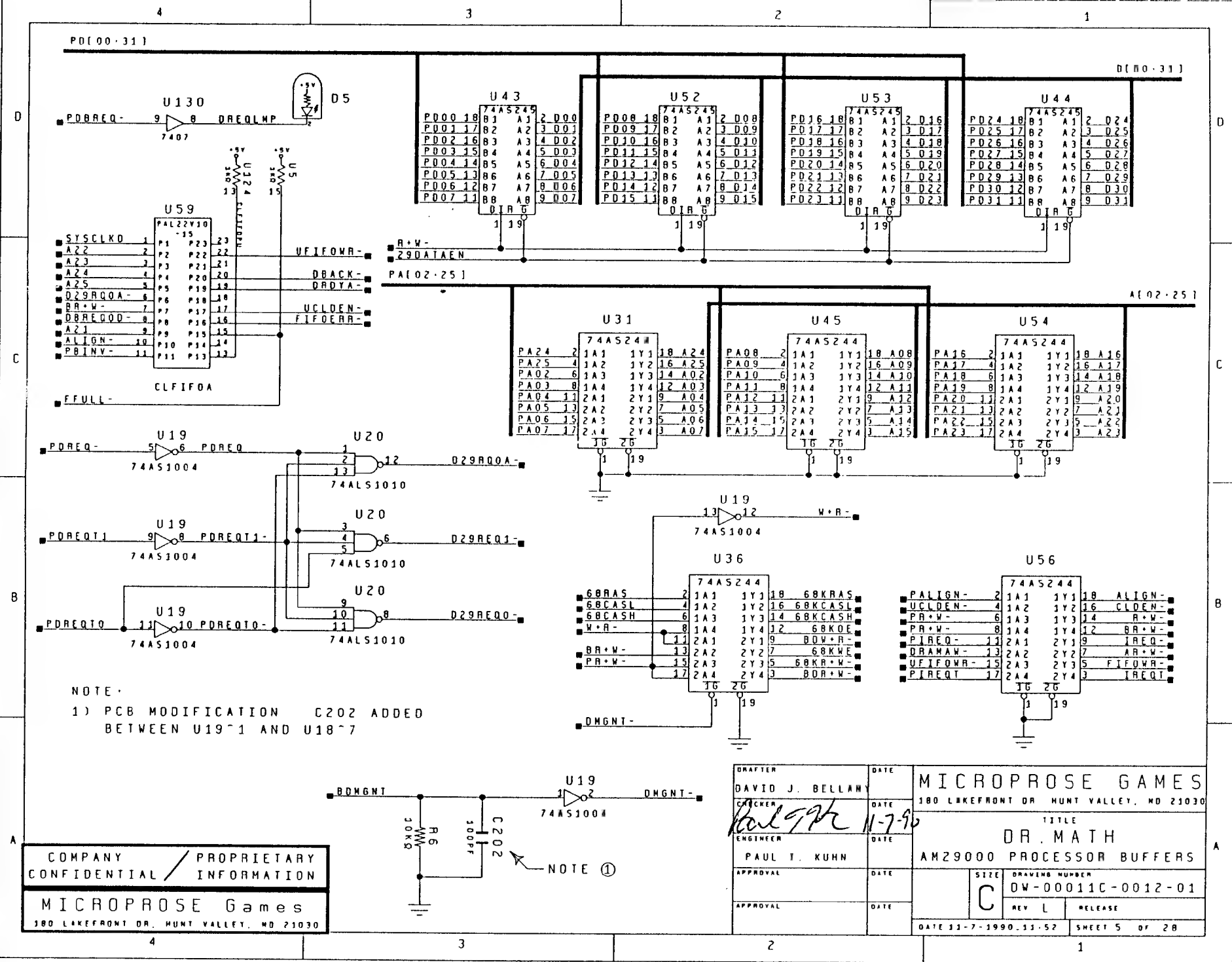
MICROPROSE Games

180 LAKEFRONT DR. HUNT VALLEY, MO 21030



DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MO 21030	
CHECKER	DATE	TITLE	
<i>Paul T. Kuhn</i>	7-25-90	DR. MATH	
ENGINEER	DATE	CLOCK GENERATOR AND	
PAUL T. KUHN		INDEPENDENT BOARD TEST RESET	
APPROVAL	DATE	SIZE	DRAWING NUMBER
		C	DW-00011C-0012-01
APPROVAL	DATE	REV F	RELEASE
		DATE 7-10-1990-11-11	SHEET 3 OF 28





NOTE:

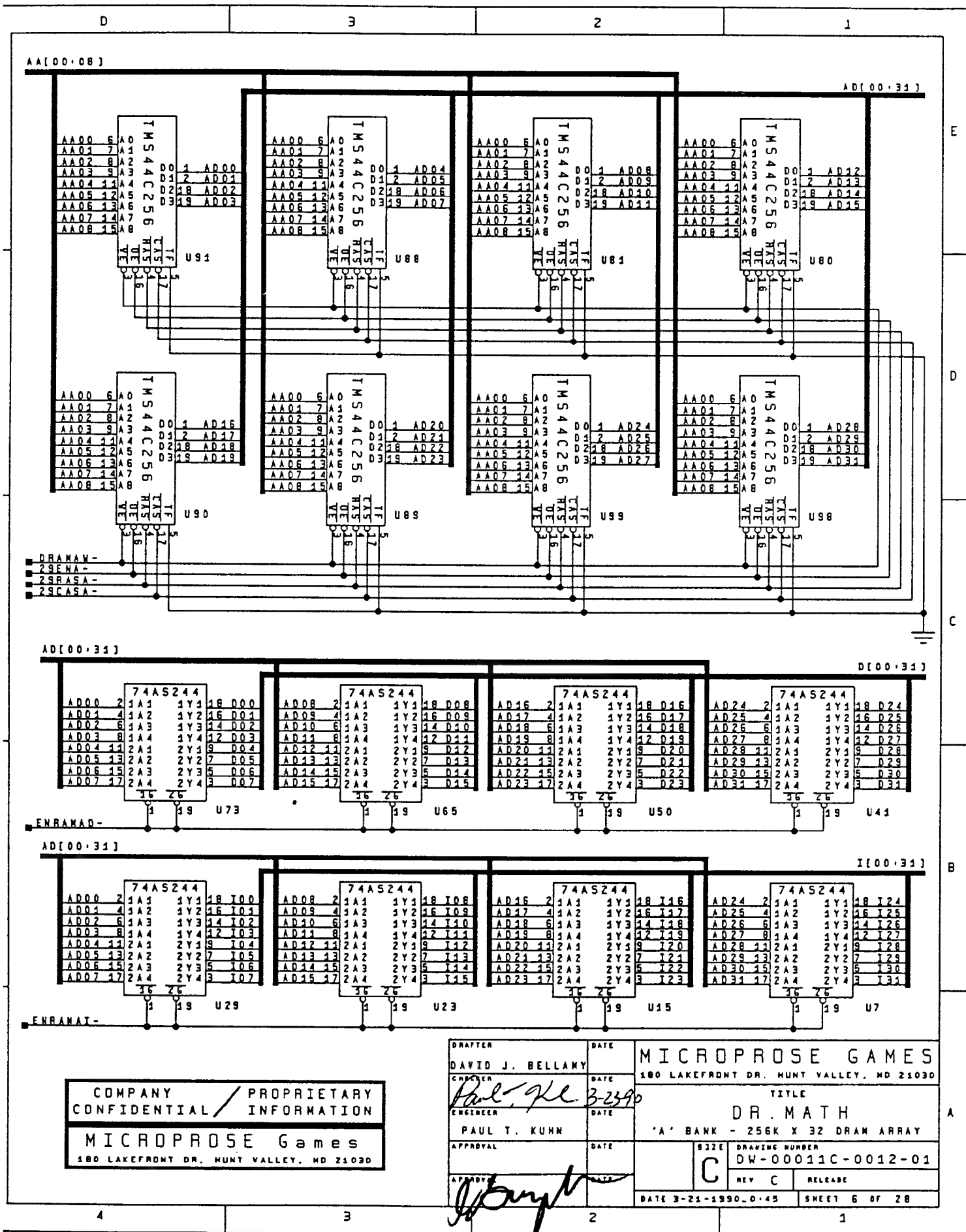
- 1) PCB MODIFICATION C202 ADDED BETWEEN U19-1 AND U18-7

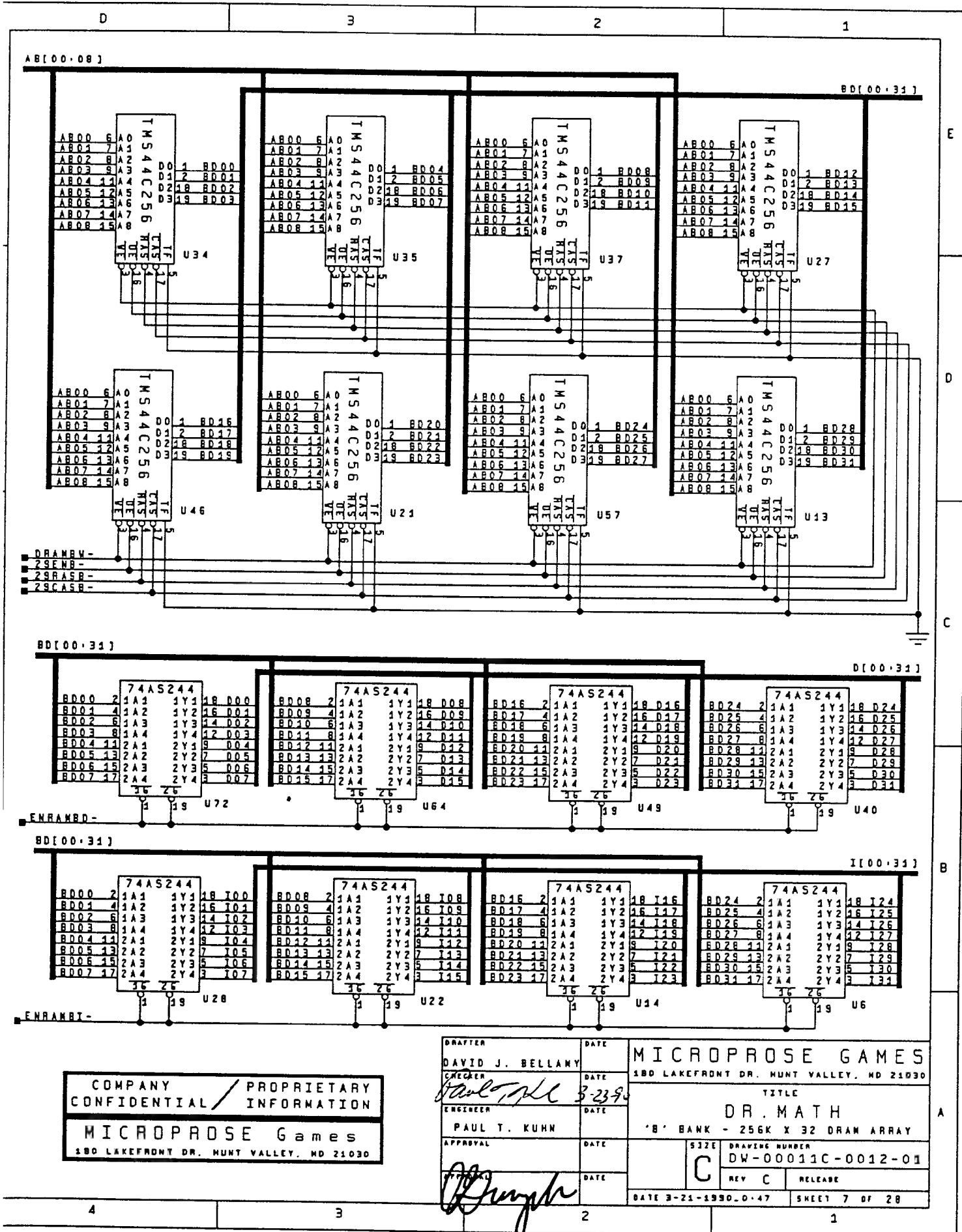
COMPANY CONFIDENTIAL / PROPRIETARY INFORMATION

MICROPROSE Games

180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY		DATE		MICROPROSE GAMES	
CHECKER <i>Karl G. Kuhn</i>		DATE		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER PAUL T. KUHN		DATE		TITLE DR. MATH	
APPROVAL		DATE		AM29000 PROCESSOR BUFFERS	
APPROVAL		DATE		SIZE C	
				DRAWING NUMBER DW-00011C-0012-01	
				REV L RELEASE	
				DATE 11-7-90 11-5-92	
				SHEET 5 OF 28	





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MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY		DATE 3-23-90		MICROPROSE GAMES 180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER <i>Paul T. Kuhn</i>		DATE			
ENGINEER PAUL T. KUHN		DATE		TITLE DR. MATH	
APPROVAL <i>[Signature]</i>		DATE		'B' BANK - 256K X 32 DRAM ARRAY	
				532E DRAWING NUMBER DW-00011C-0012-01	
				REV C RELEASE	
				DATE 3-21-1990.0-47 SHEET 7 OF 28	

4

3

2

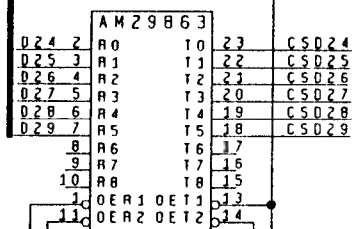
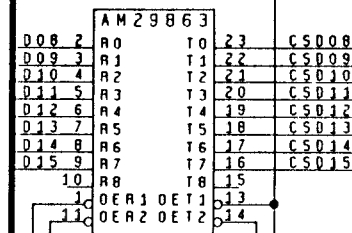
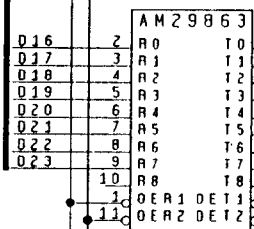
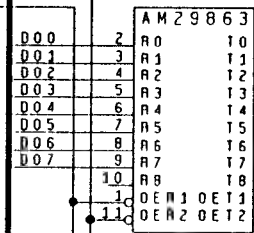
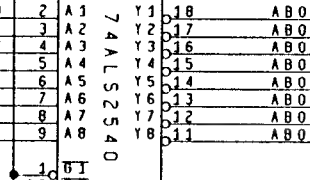
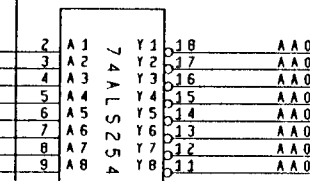
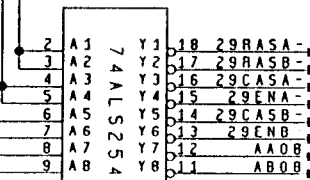
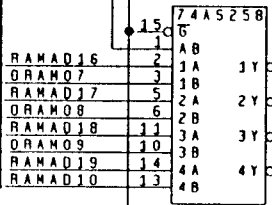
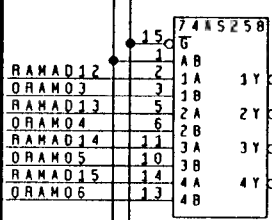
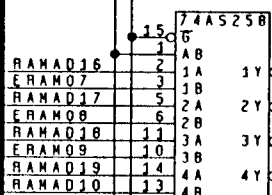
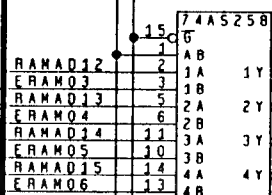
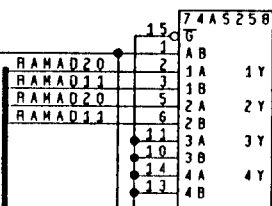
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0[00-31]

BDR+W-
 BOEN-
 BOW+R-
 29RAS
 29CASA
 29CASH

ADMUX

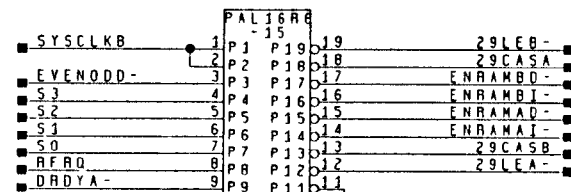
MICROPROSE Games
 COMPANY
 CONFIDENTIAL / PROPRIETARY
 INFORMATION
 180 LAKEFRONT DR. HUNT VALLEY, MD 21030



CSD[00-29]

AA[00-07]

AR[00-07]

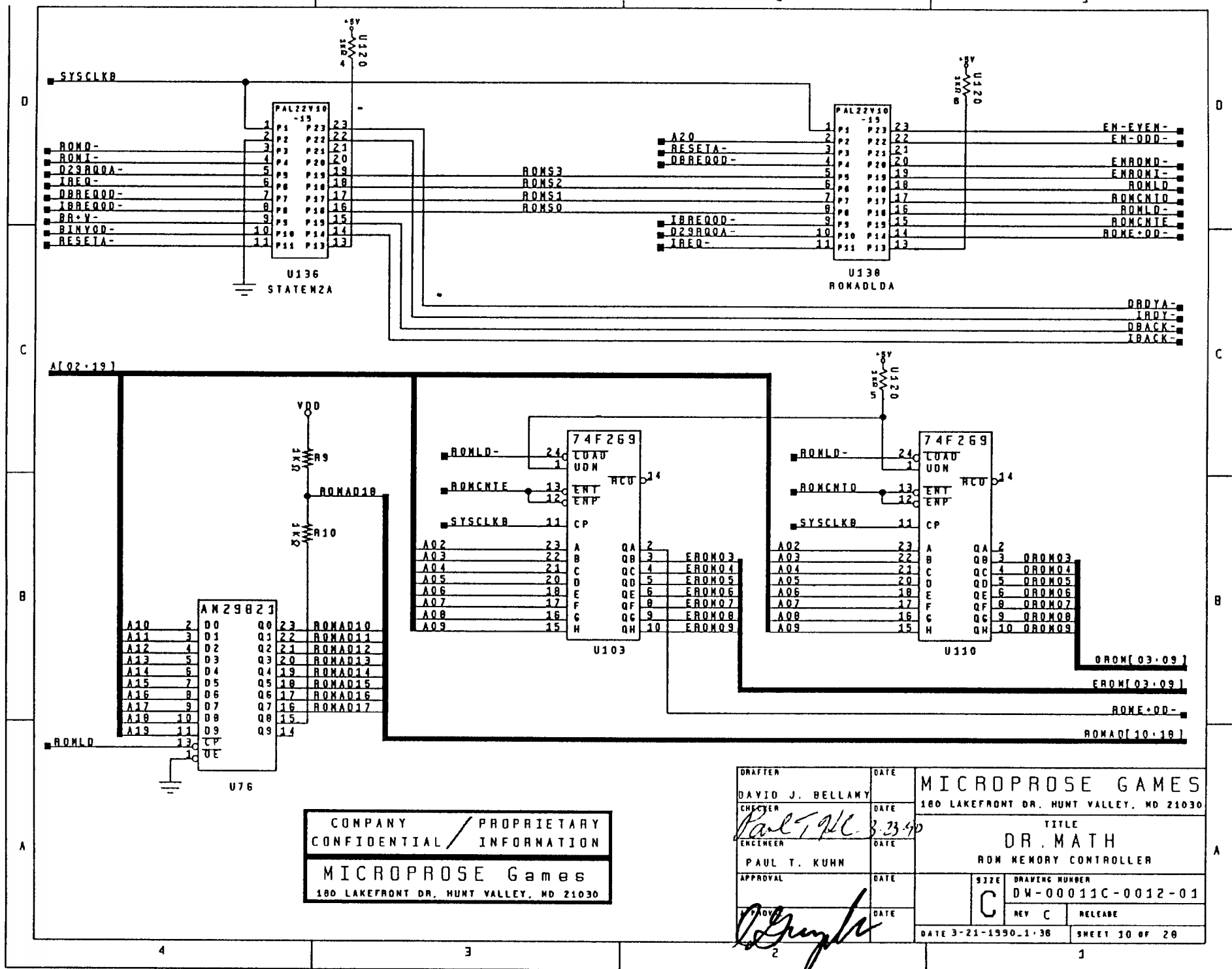


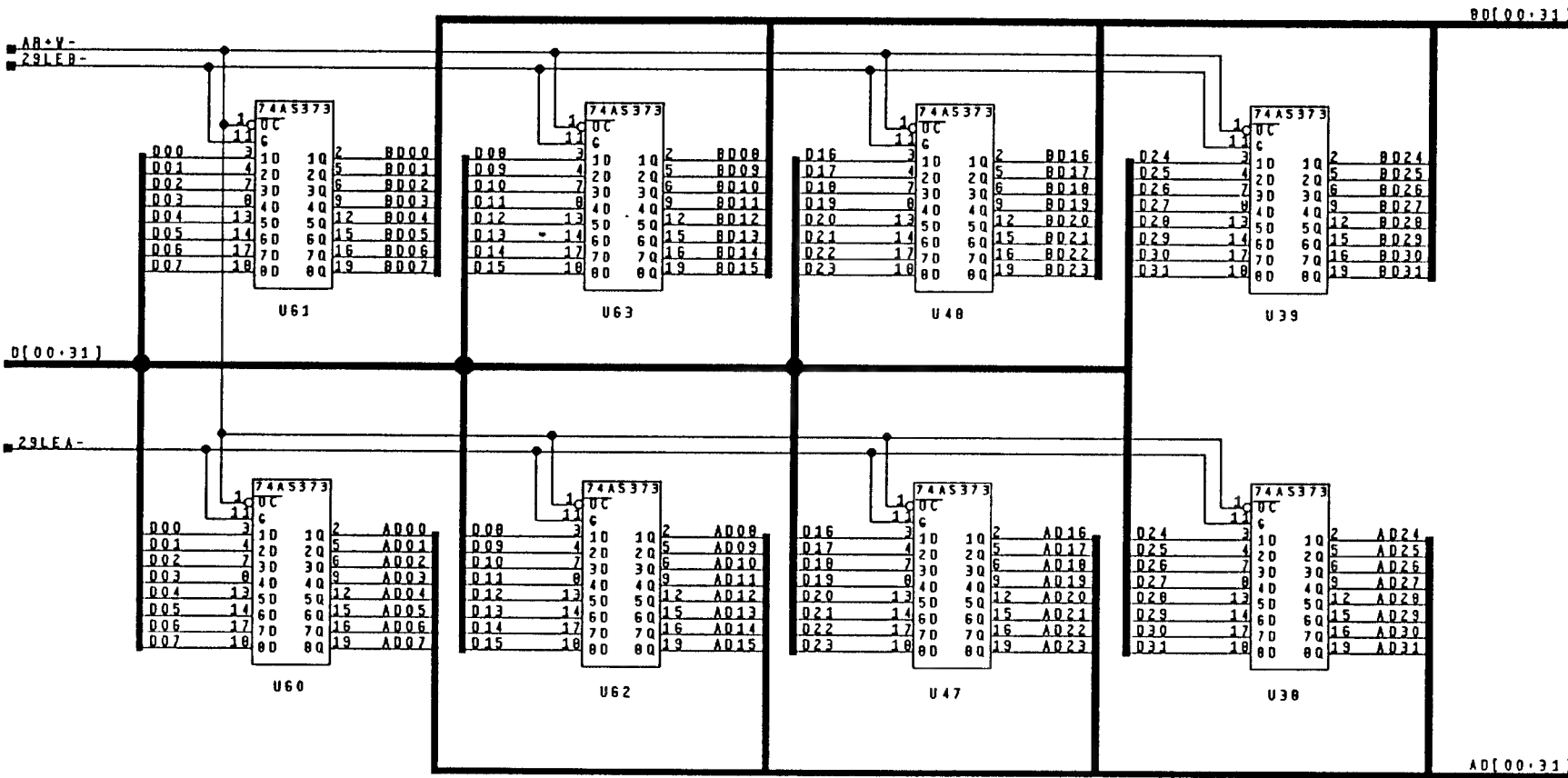
U136 RAMCNTLB

RAMCNTLB 12 13 RAMCNTPH

74AS1004

DRAFTER		DATE		MICROPROSE GAMES	
DAVID J. BELLAMY				180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER		DATE		TITLE	
PAUL I. KUHN		8-15-90		DR. MATH	
APPROVAL		DATE		ADDR MUX & WRITE LATCHES AND DATA BUFFERS	
APPROVAL		DATE		DRAWING NUMBER	
				DW-00011C-0012-01	
				REV H	
				RELEASE	
				DATE 8-15-1990-11-21	
				SHEET 9 OF 28	





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MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY		DATE		MICROPROSE GAMES	
CHECKER <i>Paul T. Kuhn</i>		DATE 3-23-90		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER PAUL T. KUHN		DATE		TITLE DR. MATH	
APPROVAL <i>Paul T. Kuhn</i>		DATE		RAM BANK DATA WRITE LATCHES	
DATE		DATE		SIZE C	
				DRAWING NUMBER DW-00011C-0012-01	
				REV C	
				RELEASE	
				DATE 3-21-1990-1-37	
				SHEET 11 OF 28	

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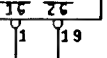
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ROM000	2	1A1	1Y1	18	100
ROM001	4	1A2	1Y2	16	101
ROM002	6	1A3	1Y3	14	102
ROM003	8	1A4	1Y4	12	103
ROM004	11	2A1	2Y1	9	104
ROM005	13	2A2	2Y2	7	105
ROM006	15	2A3	2Y3	5	106
ROM007	17	2A4	2Y4	3	107



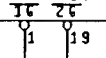
U16

ROM016	2	1A1	1Y1	18	116
ROM017	4	1A2	1Y2	16	117
ROM018	6	1A3	1Y3	14	118
ROM019	8	1A4	1Y4	12	119
ROM020	11	2A1	2Y1	9	120
ROM021	13	2A2	2Y2	7	121
ROM022	15	2A3	2Y3	5	122
ROM023	17	2A4	2Y4	3	123



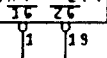
U74

ROM000	2	1A1	1Y1	18	000
ROM001	4	1A2	1Y2	16	001
ROM002	6	1A3	1Y3	14	002
ROM003	8	1A4	1Y4	12	003
ROM004	11	2A1	2Y1	9	004
ROM005	13	2A2	2Y2	7	005
ROM006	15	2A3	2Y3	5	006
ROM007	17	2A4	2Y4	3	007



U51

ROM016	2	1A1	1Y1	18	016
ROM017	4	1A2	1Y2	16	017
ROM018	6	1A3	1Y3	14	018
ROM019	8	1A4	1Y4	12	019
ROM020	11	2A1	2Y1	9	020
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ROM022	15	2A3	2Y3	5	022
ROM023	17	2A4	2Y4	3	023



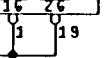
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ROM009	4	1A2	1Y2	16	109
ROM010	6	1A3	1Y3	14	110
ROM011	8	1A4	1Y4	12	111
ROM012	11	2A1	2Y1	9	112
ROM013	13	2A2	2Y2	7	113
ROM014	15	2A3	2Y3	5	114
ROM015	17	2A4	2Y4	3	115



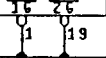
U8

ROM024	2	1A1	1Y1	18	124
ROM025	4	1A2	1Y2	16	125
ROM026	6	1A3	1Y3	14	126
ROM027	8	1A4	1Y4	12	127
ROM028	11	2A1	2Y1	9	128
ROM029	13	2A2	2Y2	7	129
ROM030	15	2A3	2Y3	5	130
ROM031	17	2A4	2Y4	3	131



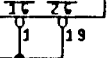
U66

ROM008	2	1A1	1Y1	18	008
ROM009	4	1A2	1Y2	16	009
ROM010	6	1A3	1Y3	14	010
ROM011	8	1A4	1Y4	12	011
ROM012	11	2A1	2Y1	9	012
ROM013	13	2A2	2Y2	7	013
ROM014	15	2A3	2Y3	5	014
ROM015	17	2A4	2Y4	3	015



U42

ROM024	2	1A1	1Y1	18	024
ROM025	4	1A2	1Y2	16	025
ROM026	6	1A3	1Y3	14	026
ROM027	8	1A4	1Y4	12	027
ROM028	11	2A1	2Y1	9	028
ROM029	13	2A2	2Y2	7	029
ROM030	15	2A3	2Y3	5	030
ROM031	17	2A4	2Y4	3	031



I[00:31]

O[00:31]

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MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY		DATE		MICROPROSE GAMES	
CHECKER <i>Paul T. Kuhn</i>		DATE 3-23-90		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER PAUL T. KUHN		DATE		TITLE 29K	
APPROVAL		DATE		29K INSTRUCTION ODD ARRAY	
DATE		DATE		DRAWING NUMBER DW-00011C-0012-01	
				REV C RELEASE	
				DATE 3-21-1990.1.37 SHEET 12 OF 20	

EROM[03-09]

AM27C512	
EROM03 10	A0 29K 90
EROM04 9	A1 29K 90
EROM05 8	A2 29K 90
EROM06 7	A3 29K 90
EROM07 6	A4 29K 90
EROM08 5	A5 29K 90
EROM09 4	A6 29K 90
ROMAD10 3	A7 29K 90
ROMAD11 25	A8 29K 90
ROMAD12 24	A9 29K 90
ROMAD13 21	A10 29K 90
ROMAD14 23	A11 29K 90
ROMAD15 2	A12 29K 90
ROMAD16 26	A13 29K 90
ROMAD17 27	A14 29K 90
ROMAD18 1	A15 29K 90

U107

AM27C512	
EROM03 10	A0 29K 90
EROM04 9	A1 29K 90
EROM05 8	A2 29K 90
EROM06 7	A3 29K 90
EROM07 6	A4 29K 90
EROM08 5	A5 29K 90
EROM09 4	A6 29K 90
ROMAD10 3	A7 29K 90
ROMAD11 25	A8 29K 90
ROMAD12 24	A9 29K 90
ROMAD13 21	A10 29K 90
ROMAD14 23	A11 29K 90
ROMAD15 2	A12 29K 90
ROMAD16 26	A13 29K 90
ROMAD17 27	A14 29K 90
ROMAD18 1	A15 29K 90

U114

AM27C512	
EROM03 10	A0 29K 90
EROM04 9	A1 29K 90
EROM05 8	A2 29K 90
EROM06 7	A3 29K 90
EROM07 6	A4 29K 90
EROM08 5	A5 29K 90
EROM09 4	A6 29K 90
ROMAD10 3	A7 29K 90
ROMAD11 25	A8 29K 90
ROMAD12 24	A9 29K 90
ROMAD13 21	A10 29K 90
ROMAD14 23	A11 29K 90
ROMAD15 2	A12 29K 90
ROMAD16 26	A13 29K 90
ROMAD17 27	A14 29K 90
ROMAD18 1	A15 29K 90

U126

AM27C512	
EROM03 10	A0 29K 90
EROM04 9	A1 29K 90
EROM05 8	A2 29K 90
EROM06 7	A3 29K 90
EROM07 6	A4 29K 90
EROM08 5	A5 29K 90
EROM09 4	A6 29K 90
ROMAD10 3	A7 29K 90
ROMAD11 25	A8 29K 90
ROMAD12 24	A9 29K 90
ROMAD13 21	A10 29K 90
ROMAD14 23	A11 29K 90
ROMAD15 2	A12 29K 90
ROMAD16 26	A13 29K 90
ROMAD17 27	A14 29K 90
ROMAD18 1	A15 29K 90

U134

EM-EVEN-

ROMAD[10-18]

ROMO[00-31]

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MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY	DATE	MICROPROSE GAMES	
CHECKER <i>Paul T. Kuhn</i>	DATE 3-23-90	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER PAUL T. KUHN	DATE	TITLE DR. MATH	
APPROVAL	DATE	EVEN INSTRUCTION EPROM	
APPROVAL	DATE	SIZE C	DRAWING NUMBER DW-00011C-0012-01
APPROVAL	DATE	REV C	RELEASE
DATE 3-21-1990-1-39		SHEET 13 OF 28	

OROM[03.09]

AM27C512	
OROM03 10	A0 29 90
OROM04 9	A1 29 90
OROM05 8	A2 29 90
OROM06 7	A3 29 90
OROM07 6	A4 29 90
OROM08 5	A5 29 90
OROM09 4	A6 29 90
ROMAD10 3	A7 29 90
ROMAD11 25	A8 29 90
ROMAD12 24	A9 29 90
ROMAD13 21	A10 29 90
ROMAD14 23	A11 29 90
ROMAD15 2	A12 29 90
ROMAD16 26	A13 29 90
ROMAD17 27	A14 29 90
ROMAD18 1	A15 29 90

U108

AM27C512	
OROM03 10	A0 29 90
OROM04 9	A1 29 90
OROM05 8	A2 29 90
OROM06 7	A3 29 90
OROM07 6	A4 29 90
OROM08 5	A5 29 90
OROM09 4	A6 29 90
ROMAD10 3	A7 29 90
ROMAD11 25	A8 29 90
ROMAD12 24	A9 29 90
ROMAD13 21	A10 29 90
ROMAD14 23	A11 29 90
ROMAD15 2	A12 29 90
ROMAD16 26	A13 29 90
ROMAD17 27	A14 29 90
ROMAD18 1	A15 29 90

U115

AM27C512	
OROM03 10	A0 29 90
OROM04 9	A1 29 90
OROM05 8	A2 29 90
OROM06 7	A3 29 90
OROM07 6	A4 29 90
OROM08 5	A5 29 90
OROM09 4	A6 29 90
ROMAD10 3	A7 29 90
ROMAD11 25	A8 29 90
ROMAD12 24	A9 29 90
ROMAD13 21	A10 29 90
ROMAD14 23	A11 29 90
ROMAD15 2	A12 29 90
ROMAD16 26	A13 29 90
ROMAD17 27	A14 29 90
ROMAD18 1	A15 29 90

U127

AM27C512	
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OROM04 9	A1 29 90
OROM05 8	A2 29 90
OROM06 7	A3 29 90
OROM07 6	A4 29 90
OROM08 5	A5 29 90
OROM09 4	A6 29 90
ROMAD10 3	A7 29 90
ROMAD11 25	A8 29 90
ROMAD12 24	A9 29 90
ROMAD13 21	A10 29 90
ROMAD14 23	A11 29 90
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U135

EM-000-

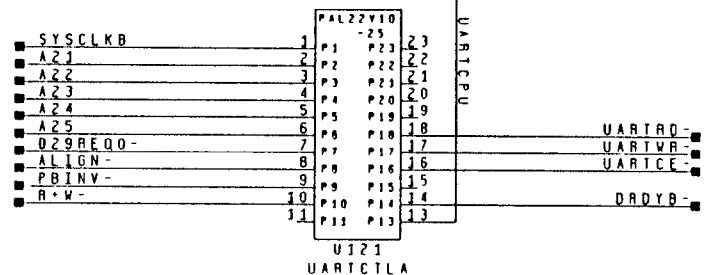
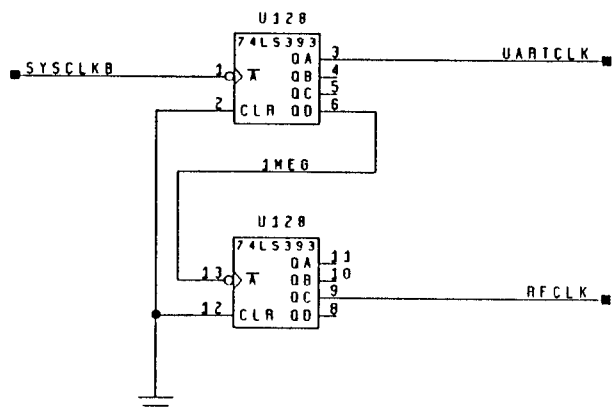
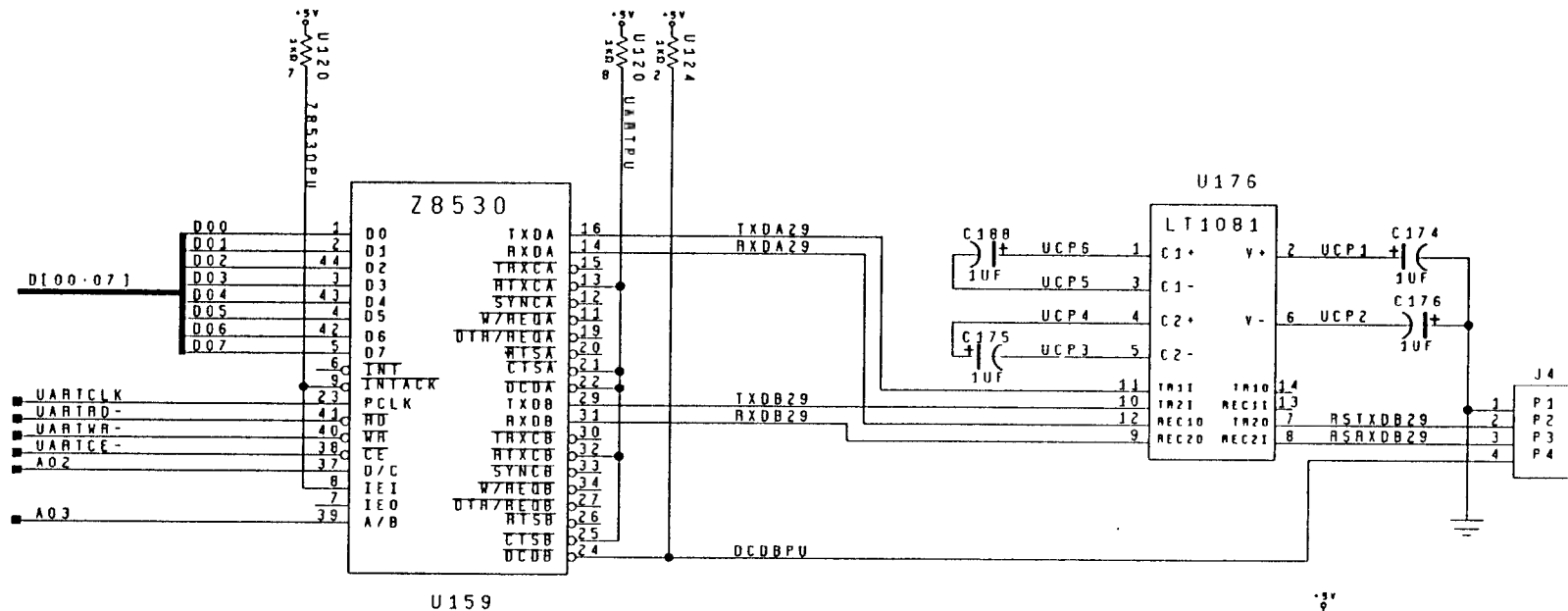
ROMAD[10.10]

ROMD[00.31]

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MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY		DATE		MICROPROSE GAMES	
CHECKER <i>Paul T. Kuhn</i>		DATE 3-23-90		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER PAUL T. KUHN		DATE		TITLE DR. MATH	
APPROVAL		DATE		ODD INSTRUCTION EPROM	
DATE		DATE		DRAWING NUMBER DW-00011C-0012-01	
DATE		DATE		REV C	
DATE		DATE		RELEASE	
DATE		DATE		DATE 3-21-1990-1-39	
DATE		DATE		SHEET 14 OF 28	



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MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J BELLAMY		DATE 7-25-90		MICROPROSE GAMES	
CHECKER Paul T Kuhn		DATE 7-25-90		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER PAUL T KUHN		DATE		TITLE DR. MATH	
APPROVAL		DATE		AM29000 UART	
APPROVAL		DATE		DRAWING NUMBER DW-00011C-0012-01	
				REV F RELEASE	
				DATE 7-6-1990-9-53	
				SHEET 15 OF 28	

RNY[00:31]

X[00:31]

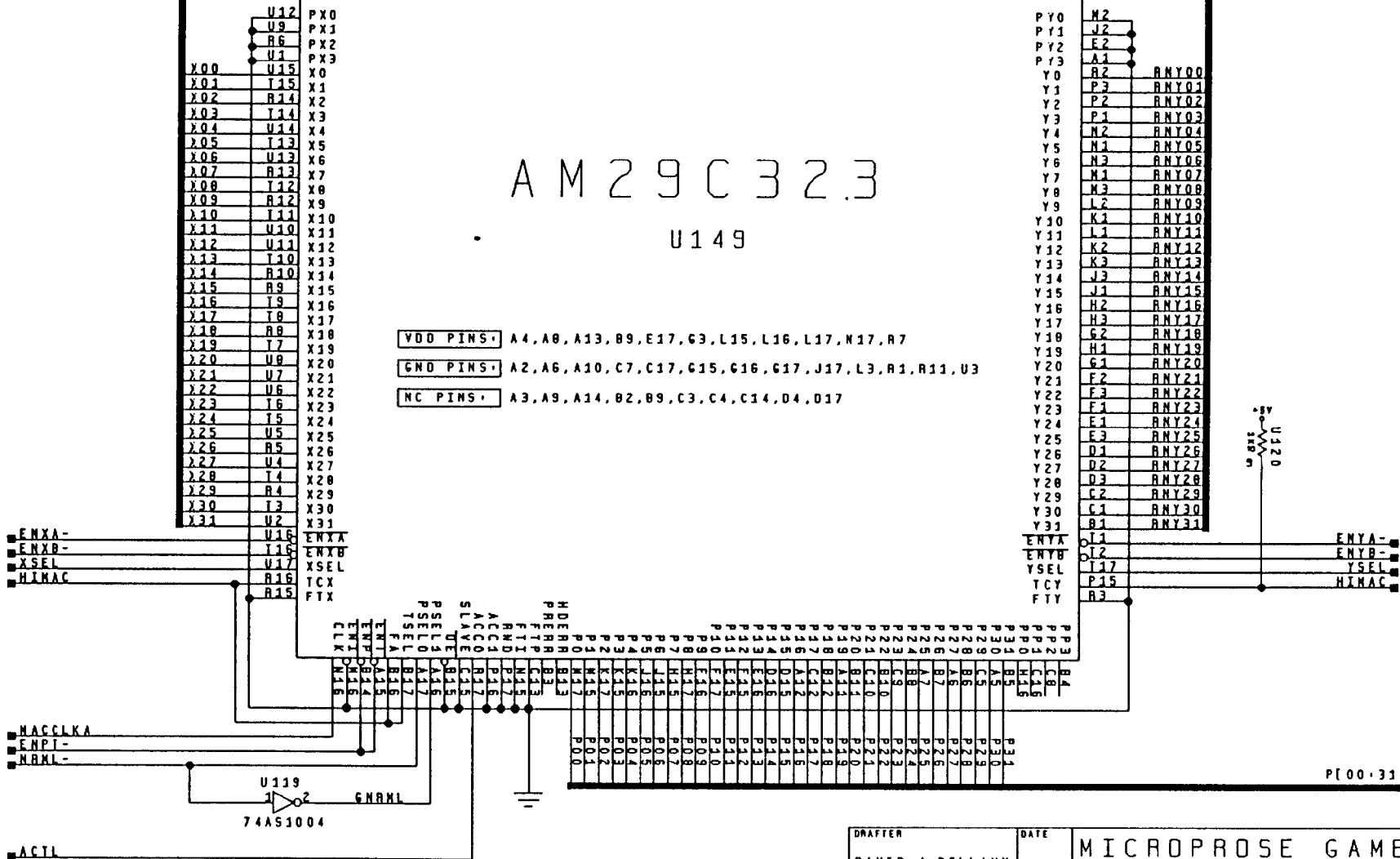
A M 2 9 C 3 2 . 3

U149

VDD PINS: A4, A8, A13, B9, E17, G3, L15, L16, L17, N17, R7

GND PINS: A2, A6, A10, C7, C17, G15, G16, G17, J17, L3, R1, R11, U3

NC PINS: A3, A9, A14, B2, B9, C3, C4, C14, D4, D17



P[00:31]

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MICROPROSE Games
180 LAKEFRONT DR, HUNT VALLEY, MD 21030

DRAFTER		DATE		MICROPROSE GAMES	
DAVID J. BELLAMY				180 LAKEFRONT DR HUNT VALLEY, MD 21030	
CHECKER		DATE		TITLE	
PAUL T. KUHN				DR. MATH	
ENGINEER		DATE		MULTIPLY ACCUMULATOR	
APPROVAL		DATE		SIZE	
				DRAWING NUMBER	
				DW-00011C-0012-01	
				REV C	
				RELEASE	
				DATE 3-21-1990-1:40	
				SHEET 16 OF 28	

MACCLKB
MACCLKA
NRNL-
RESETC-
MULOEEN-
P[00:31]

BNY[00:31]

P14	2	00	Y0	23	BNY00
P15	3	01	Y1	22	BNY01
P16	4	02	Y2	21	BNY02
P17	5	03	Y3	20	BNY03
P18	6	04	Y4	19	BNY04
P19	7	05	Y5	18	BNY05
P20	8	06	Y6	17	BNY06
P21	9	07	Y7	16	BNY07
P22	10	08	Y8	15	BNY08
	11	09	Y9	14	

AM29827

1
13
UE1
UE2

U157

P00	2	00	Q0	23	BNY18
P01	3	01	Q1	22	BNY19
P02	4	02	Q2	21	BNY20
P03	5	03	Q3	20	BNY21
P04	6	04	Q4	19	BNY22
P05	7	05	Q5	18	BNY23
P06	8	06	Q6	17	BNY24
P07	9	07	Q7	16	BNY25
	10	08	Q8	15	

AM29823

13
CP
EM
CLM
UE

U146

P23	2	00	Y0	23	BNY09
P24	3	01	Y1	22	BNY10
P25	4	02	Y2	21	BNY11
P26	5	03	Y3	20	BNY12
P27	6	04	Y4	19	BNY13
P28	7	05	Y5	18	BNY14
P29	8	06	Y6	17	BNY15
P30	9	07	Y7	16	BNY16
P31	10	08	Y8	15	BNY17
	11	09	Y9	14	

AM29827

1
13
UE1
UE2

U155

P08	2	00	Q0	23	BNY26
P09	3	01	Q1	22	BNY27
P10	4	02	Q2	21	BNY28
P11	5	03	Q3	20	BNY29
P12	6	04	Q4	19	BNY30
P13	7	05	Q5	18	BNY31
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	9	07	Q7	16	
	10	08	Q8	15	

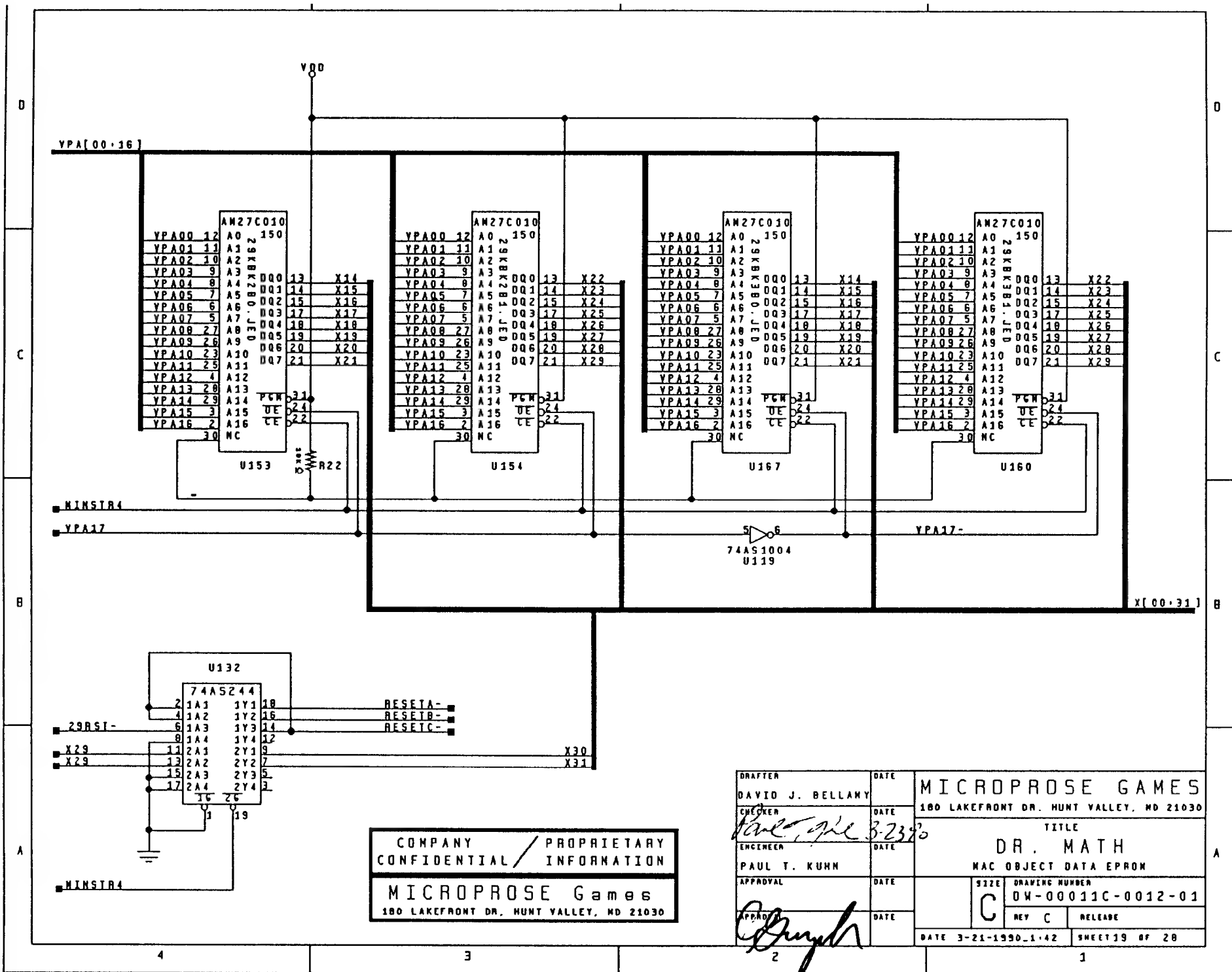
AM29823

13
CP
EM
CLM
UE

U137

COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY	DATE	MICROPROSE GAMES	
CHECKER <i>Paul T. Kuhn</i>	DATE 3-23-90	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER PAUL T. KUHN	DATE	TITLE DR. MATH	
APPROVAL	DATE	DOT PRODUCT NORMALIZATION	
APPROVAL <i>DeBryh</i>	DATE	SIZE C	DRAWING NUMBER DW-00011C-0012-01
		REV C	RELEASE
		DATE 3-21-1990 20:37 SHEET 18 OF 28	



COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION

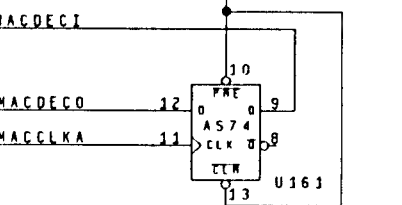
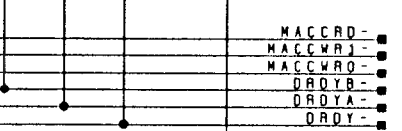
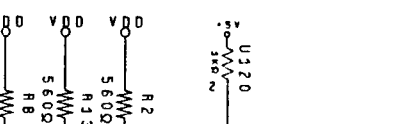
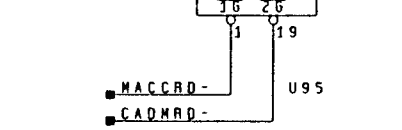
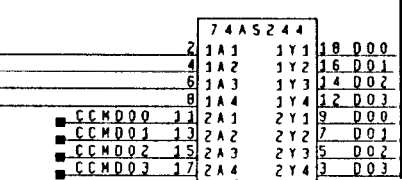
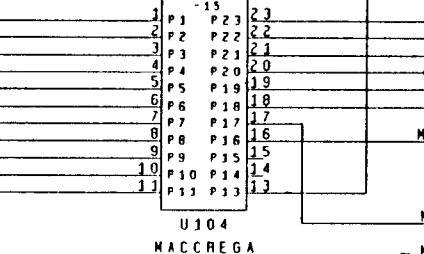
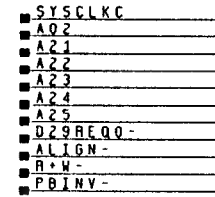
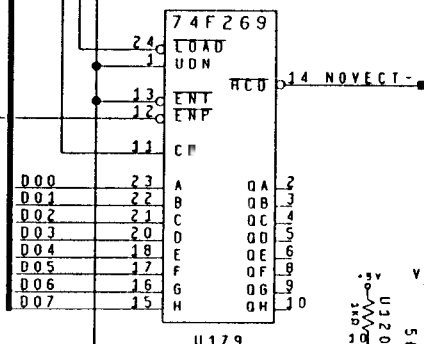
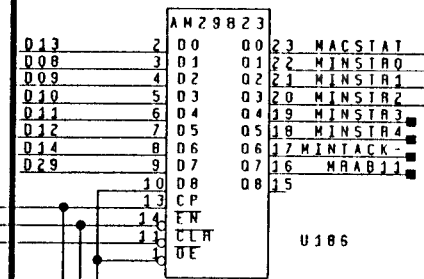
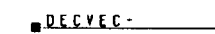
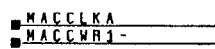
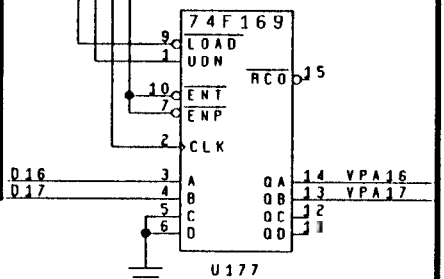
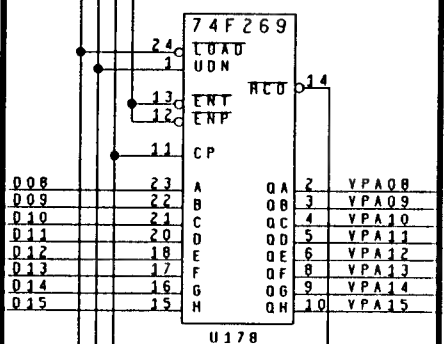
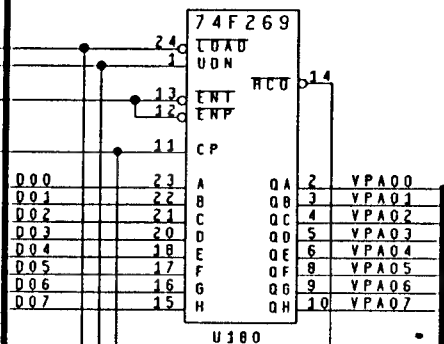
MICROPROSE Games

180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY		DATE		MICROPROSE GAMES	
CHECKER <i>David J. Bellamy</i>		DATE		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER PAUL T. KUHN		DATE		TITLE DR. MATH	
APPROVAL		DATE		MAC OBJECT DATA EPROM	
APPROVAL <i>David J. Bellamy</i>		DATE		DRAWING NUMBER DW-00011C-0012-01	
				REV C RELEASE	
				DATE 3-21-1990-1-42 SHEET 19 OF 28	

0[00:31]

MACCWR0-
VPAUDN
VPACEN-
MACCLKA



COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION
MICROPROSE Games
180 LAKEFRONT DR., HUNT VALLEY, MD 21030

VPA[00:17]

DRAFTER DAVID J BELLAMY		DATE 7-25-90		MICROPROSE GAMES	
CHECKER Paul T Kuhn		DATE 7-25-90		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER PAUL T KUHN		DATE		TITLE DR. MATH	
APPROVAL		DATE		VERTEX POOL ADDRESS AND CONTROL REG	
APPROVAL		DATE		DRAWING NUMBER DW-00011C-0012-01	
				REV F RELEASE	
				DATE 7-6-1990-10-31 SHEET 20 OF 28	

D

3

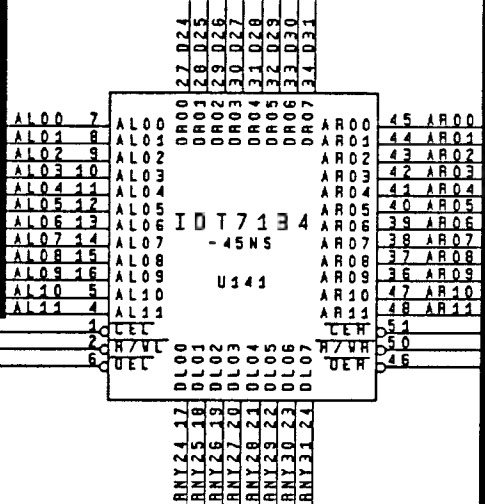
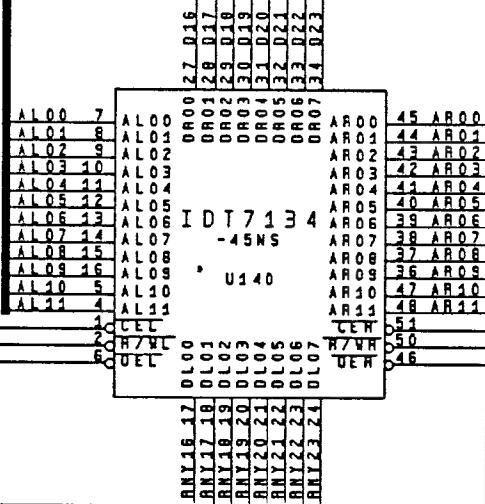
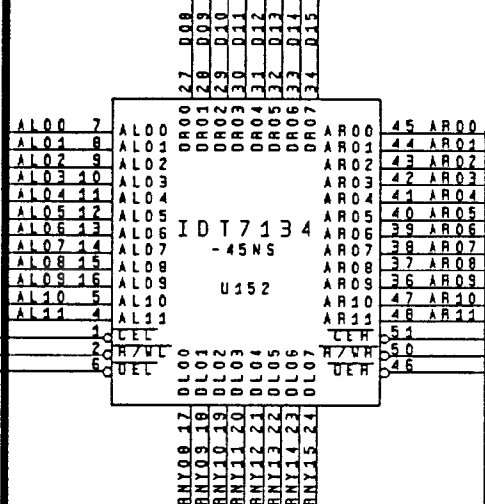
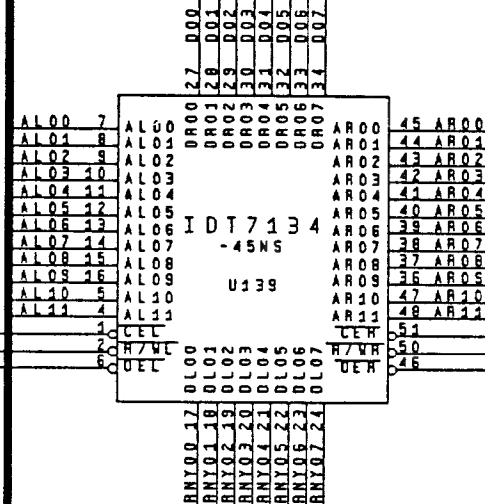
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1

AL(00.11)

CER-
 R=VR-
 V=R-
 FEL-
 R=VL-
 CEL-

DI(00.31)



RNY(00.31)

AR(00.11)

COMPANY / PROPRIETARY
 CONFIDENTIAL / INFORMATION

MICROPROSE Games

180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER
 DAVID J. BELLAMY
 CHECKER
 PAUL T. KUHN
 ENGINEER
 APPROVAL
 DATE

DATE

DATE

DATE

DATE

DATE

MICROPROSE GAMES

180 LAKEFRONT DR. HUNT VALLEY, MD 21030

TITLE

DR. MATH

MAC DUAL PORT SRAM ARRAY

SIZE

C

DRAWING NUMBER

DW-00011C-0012-01

REV C

RELEASE

DATE 3-24-1990.1.45

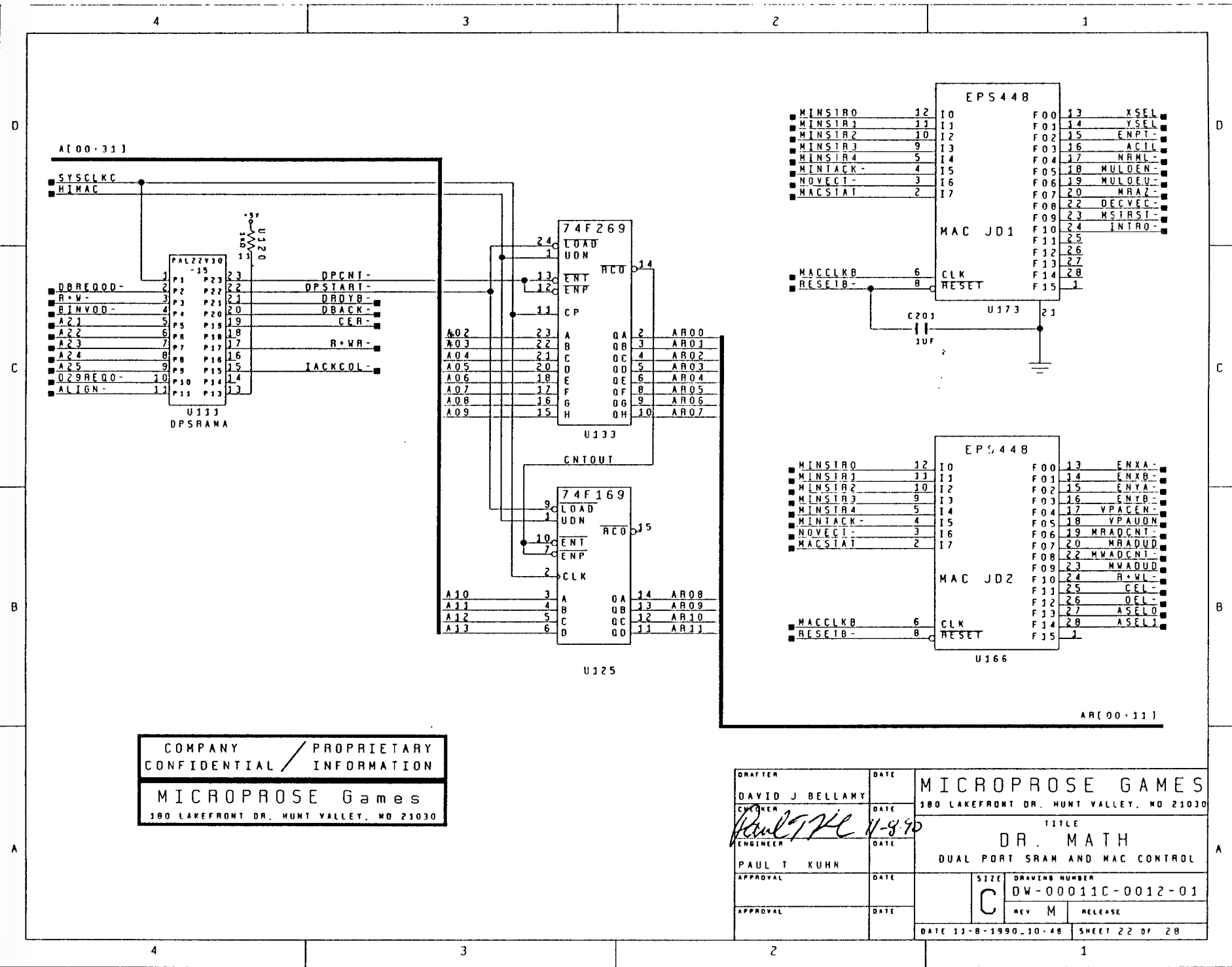
SHEET 21 OF 28

4

3

2

1



COMPANY CONFIDENTIAL / PROPRIETARY INFORMATION

MICROPROSE Games

180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER		DATE		MICROPROSE GAMES	
DAVID J BELLAMY				180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER		DATE		TITLE	
<i>Paul T Kuhn</i>		11-8-90		DR. MATH	
ENGINEER		DATE		DUAL PORT SRAM AND MAC CONTROL	
PAUL T KUHN					
APPROVAL		DATE		SIZE	
				DRAWING NUMBER	
				DW-00011C-0012-01	
APPROVAL		DATE		REV M	
				RELEASE	
DATE 11-8-1990 10:48				SHEET 22 OF 28	

MRAA[00:11]

MVA[00:11]

VPA[00:11]

ASEL1

ASEL0

MRAB[00:03]

MARPU

YPA00
MVA00
MRAA00
MRAB00
YPA01
MVA01
MRAA01
MRAB01

74AS153

1C0

1C1

1C2 1Y 7 AL00

1C3

2C0

2C1 2Y 9 AL01

2C2

2C3

A

B 1C 2C

U174

YPA02
MVA02
MRAA02
MRAB02
YPA03
MVA03
MRAA03
MRAB03

74AS153

1C0

1C1

1C2 1Y 7 AL02

1C3

2C0

2C1 2Y 9 AL03

2C2

2C3

A

B 1C 2C

U171

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MRAA04
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MVA05
MRAA05

74AS153

1C0

1C1

1C2 1Y 7 AL04

1C3

2C0

2C1 2Y 9 AL05

2C2

2C3

A

B 1C 2C

U175

MRAZ-

MRARVD

MRADCNT-

MACCLKB

74F169

LOAD

UDN

RCO 15

ENT

ENP

CLK

A

B

C

D

U181

QA 14 MRAR00
QB 13 MRAR01
QC 12 MRAR02
QD 11 MRAR03

YPA06
MVA06
MRAA06
YPA07
MVA07
MRAA07

74AS153

1C0

1C1

1C2 1Y 7 AL06

1C3

2C0

2C1 2Y 9 AL07

2C2

2C3

A

B 1C 2C

U164

YPA08
MVA08
MRAA08
YPA09
MVA09
MRAA09

74AS153

1C0

1C1

1C2 1Y 7 AL08

1C3

2C0

2C1 2Y 9 AL09

2C2

2C3

A

B 1C 2C

U170

YPA10
MVA10
MRAA10
YPA11
MVA11
MRAA11

74AS153

1C0

1C1

1C2 1Y 7 AL10

1C3

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A

B 1C 2C

U163

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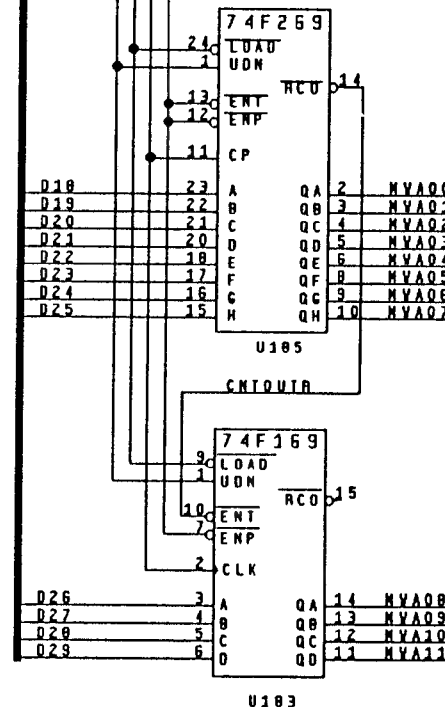
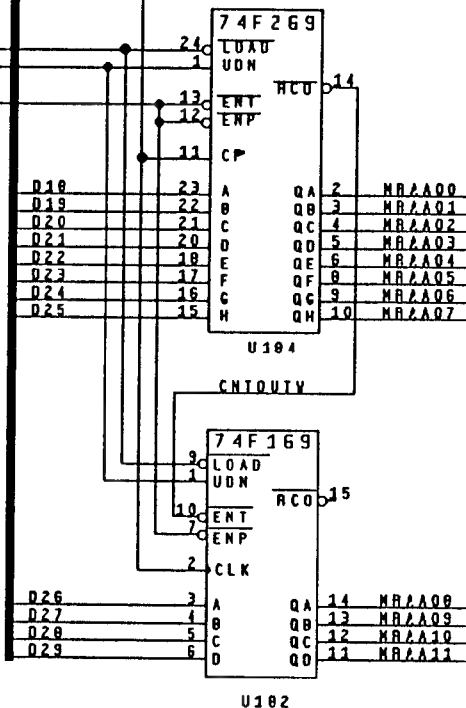
DRAFTER		DATE		MICROPROSE GAMES	
DAVID J. BELLAMY				180 LAKEFRONT DR. HUNT VALLEY, MO 21030	
CHECKER		DATE		TITLE	
<i>David J. Bellamy</i>		3-23-90		DR. MATH	
ENGINEER		DATE		MAC SRAM ADDRESS MUXES	
PAUL T. KUHN					
APPROVAL		DATE		DRAWING NUMBER	
<i>Paul T. Kuhn</i>				DW-00011C-0012-01	
DATE		DATE		REV C	
3-21-1990		1-47		RELEASE	
DATE 3-21-1990-1-47				SHEET 23 OF 28	

COMPANY PROPRIETARY
CONFIDENTIAL / INFORMATION
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MO 21030

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 MACCLKB
 MACCVRO-
 MVA0UD

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MACCVR1-
 MRA0UD
 MRA0CNT-



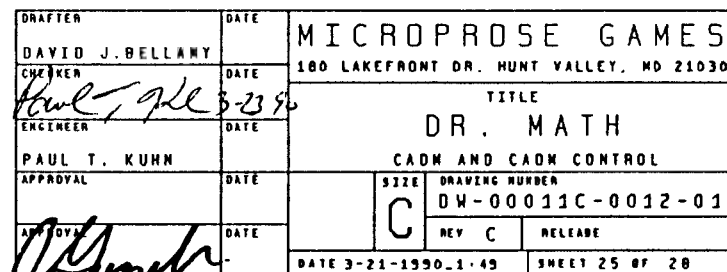
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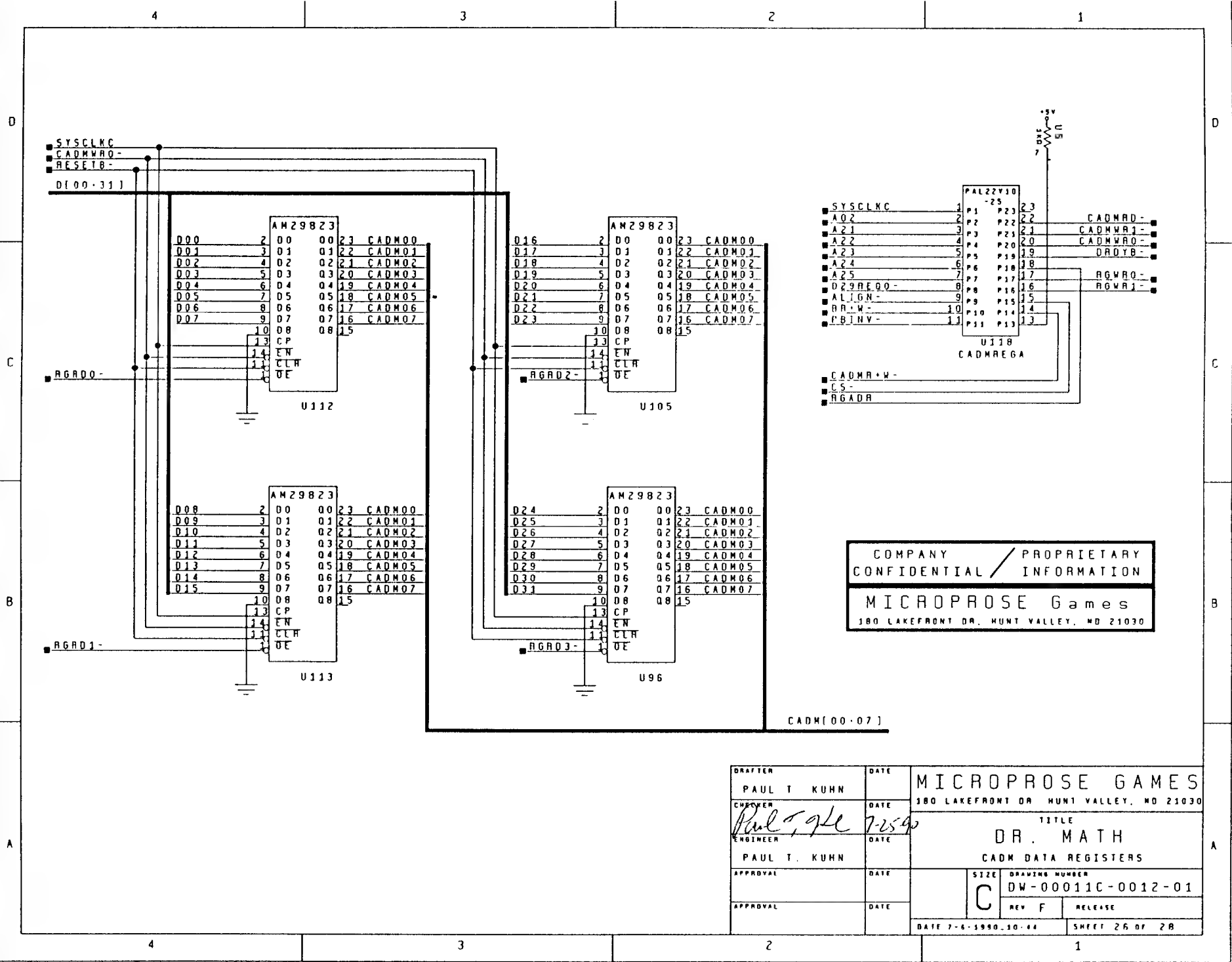
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COMPANY / PROPRIETARY
 CONFIDENTIAL / INFORMATION
 MICROPROSE Games
 100 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY		DATE		MICROPROSE GAMES 100 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER <i>Paul T. Kuhn</i>		DATE			
ENGINEER PAUL T. KUHN		DATE		TITLE DR. MATH	
APPROVAL		DATE		MAC SRAM ADDRESS COUNTERS	
APPROVAL <i>[Signature]</i>		DATE		SIZE C	DRAWING NUMBER DW-00011C-0012-01
				REV C	RELEASE
DATE 3-21-1990-1.40				SHEET 24 OF 20	

180 LAKEFRONT DR, HUNT VALLEY, MD 21030



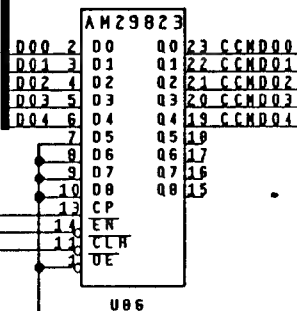


DRAFTER PAUL T. KUHN		DATE 7-25-90	MICROPROSE GAMES	
CHECKER <i>Paul T. Kuhn</i>		DATE 7-25-90	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER PAUL T. KUHN		DATE	TITLE DR. MATH	
APPROVAL		DATE	CADM DATA REGISTERS	
APPROVAL		DATE	SIZE C	
			DRAWING NUMBER DW-00011C-0012-01	
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			RELEASE	
			DATE 7-6-1990-10-44	
			SHEET 26 OF 28	

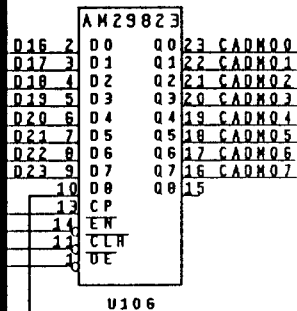
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■ RESETC-

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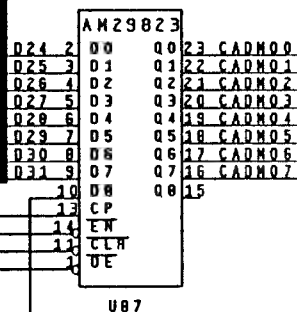
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74AS00



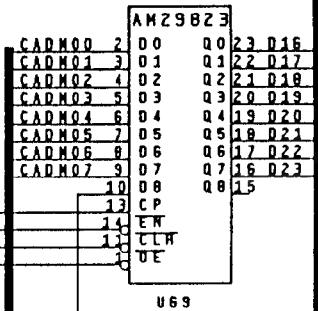
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■ RGRD5-

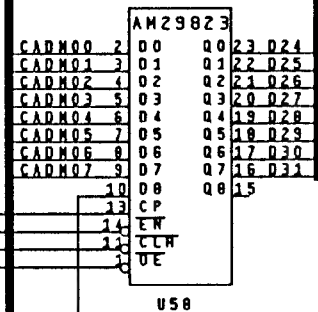


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■ RGVRO-

■ CADMRD-



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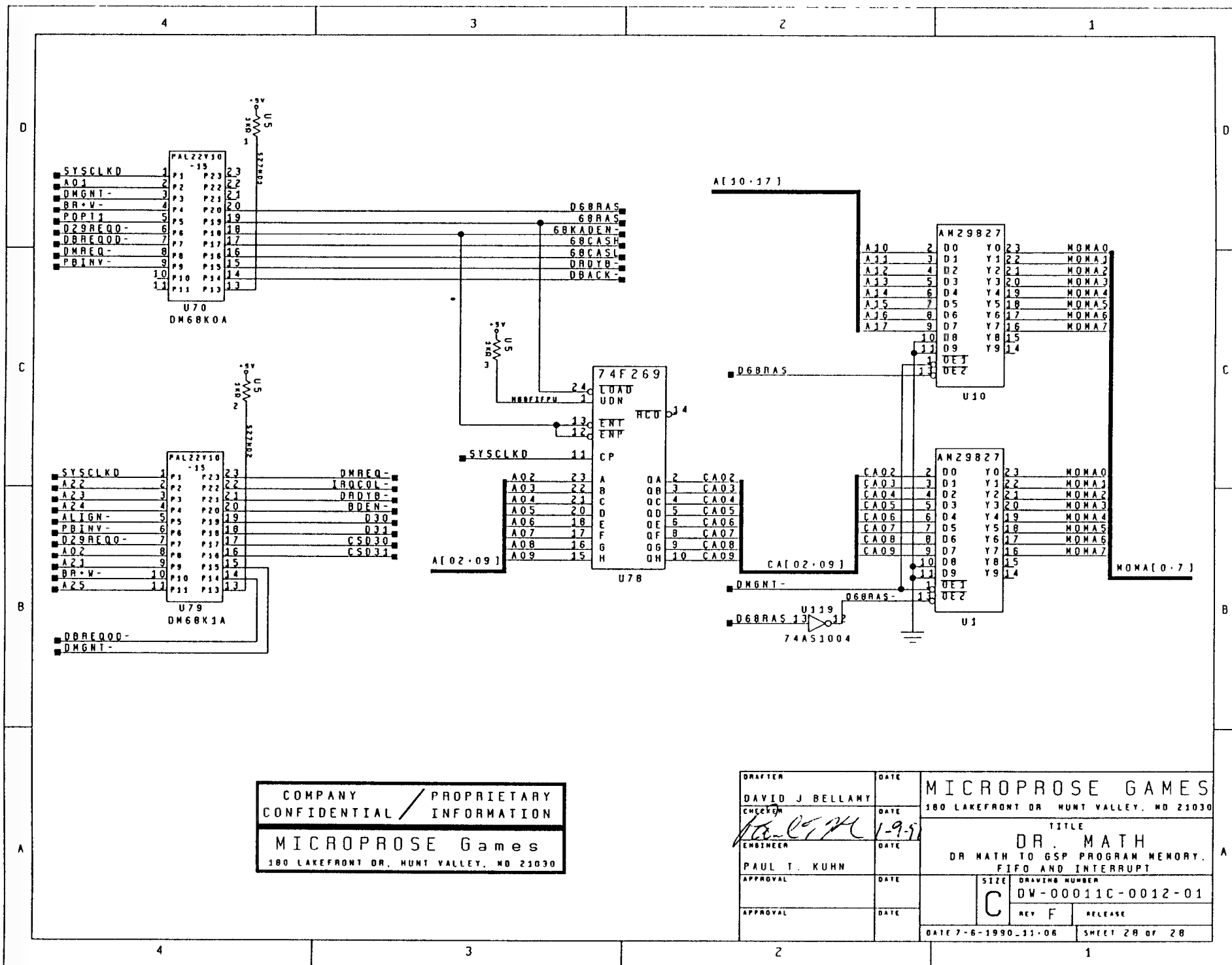
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COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION

MICROPROSE Games

180 LAKEFRONT DR, HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY		DATE		MICROPROSE GAMES	
CHECKER <i>Paul T. Kuhn</i>		DATE 3-21-1990		180 LAKEFRONT DR, HUNT VALLEY, MD 21030	
ENGINEER PAUL T. KUHN		DATE		TITLE DR. MATH	
APPROVAL		DATE		CADM DATA REGISTERS	
APPROVAL <i>David Bellamy</i>		DATE		DRAWING NUMBER DW-00011C-0012-01	
				REV C	
				RELEASE	
				DATE 3-21-1990-1:50	
				SHEET 27 OF 28	



COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J BELLAMY		DATE 1-9-91		MICROPROSE GAMES 180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER <i>[Signature]</i>		DATE			
ENGINEER PAUL T. KUHN		DATE		TITLE DR. MATH DR. MATH TO GSP PROGRAM MEMORY, FIFO AND INTERRUPT	
APPROVAL		DATE		DRAWING NUMBER DW-00011C-0012-01	
APPROVAL		DATE		REV F RELEASE	
DATE 7-6-1990-11-06				SHEET 28 OF 28	

BILL OF MATERIALS
DR. MATH P.C.B.
ASSEMBLY : A10-00002-001

DATE	ECN	REV	SHEET NUMBER																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	ECN	A	A					A	A																		
	ECN	B	B				B																				
3-21-90	ECN	C	C	C	C	C	C	C	C																		
5-07-90	ECN014	D	D		D			D																			
5-07-90	ECN015	E	E						E																		
6-18-90	ECN038	F	F						F																		
7-16-90	ECN051	G	G	G			G		G																		
7-27-90	ECN055	H	H				H																				
8-01-90	ECN060	K	K	K	K	K	K	K	K																		
8-15-90	ECN064	L	L		L																						
9-04-90	ECN069	M	M	M					M																		
10-8-90	ECN081	N	N						N																		
10-8-90	ECN090	O	O			O			O																		
11-8-90	ECN137	P	P			P																					
1-14-91	ECN125	R	R		R																						

COMPANY CONFIDENTIAL /
PROPRIETARY INFORMATION
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER
DAVID J BELLAMY
DATE
1-14-91

CHECKER
Paul T Kuhn
DATE
1-14-91

ENGINEER
PAUL T KUHN
DATE

APPROVAL
DATE

APPROVAL
DATE

MICROPROSE GAMES
180 LAKEFRONT DRIVE, HUNT VALLEY, MD 21030

TITLE
BILL OF MATERIALS
DR. MATH P.C.B.
A10-00002-001

DWG NO
PL-00011A-0012-01
REV
R

DATE 1-14-1991-9-45
SHEET 1 OF 7

A

MICROPROSE games, 180 Lakefront Drive, Hunt Valley, Maryland, 21030
 PROJECT: DR. MATH PCB DRWG NO: PL-0011A-0012-01 REV: R
 DATE: Mon 14-Jan-1991

ITEM	QTY	VENDOR PART NUMBER	PART DESCRIP	VALUE	MPG P/N
		REF. DES.			
1 B	1	GAL22V10-15P U79	DM68K1A	15NS	120-00001-009
2 B	1	GAL22V10-15P U70	DM68K0A	15NS	120-00001-010
3 B	[0]	GAL22V10-25P [U118]	CADMREGA	25NS	120-00001-011
4	[0]	SN74ALS138N [U97]	3:8DEMUX		200-00138-200
5	1	68001-502 [J1],J2	2PINJUMPER	.100"	610-00002-002
6 *	[0]	AM95C85-12JC [U32,U33]	SMT CADM		130-95C85-412
7	6	SN74AS153N U175,U174,U163,U164,U171,U170	4:1DATAMUX		201-00153-200
8 B	1	GAL22V10-15P U111	DPSRAMA	15NS	120-00001-014
9 C*	[0]	EPS448-3P [U55]	CADM SAM	20MHZ	115-00001-003
10 *	4	IDT7134-S45J U139,U140,U141,U152	4Kx8DPRAM SMT	45NS	222-00003-445
11	5	F74F169PC U125,U177,U181,U182,U183	4BITU/DCNTR		203-00169-200
12	1	SN74ALS04BN U143	HEXINVERTER		200-00004-200
13	1	SN74AS08N U148	QUAD2INAND		201-00008-200
14 B	1	GAL22V10-15P U104	MACCREGA	15NS	120-00001-015
15 E*	1	AM27C010-155DC U153	128Kx8EPROM 29KBK2B0	150NS	110-00001-014
16 E*	1	AM27C010-155DC U154	128Kx8EPROM 29KBK2B1	150NS	110-00001-015
17 E*	1	AM27C010-155DC U167	128Kx8EPROM 29KBK3B0	150NS	110-00001-016
18 E*	1	AM27C010-155DC U160	128Kx8EPROM 29KBK3B1	150NS	110-00001-017

ITEM	QTY	PART NUMBER REF. DES.	PART DESCRIP	VALUE	MPG P/N
19	4	AM29C827APC U1,U10,U155,U157	10BITBUFFER		235-00006-200
20	7	AM29C823ASC [U58,U69,U86,U87,U96,U105,U106,U112,U113],U137,U162, U165,U169,U172,U186,U146	SMT9BITBUSREG		235-00004-100
21 F*	1	AM29C323GC U149	MAC IC	10MHZ	130-00323-510
22	4	173D105X0035V C174,C175,C176,C188	AXTANTCAP	1UF	422-00072-105
23	1	LT1081-CN U176	RS232DRVR		235-00001-200
24	1	SN74LS393N U128	DUAL4BITCNTR		202-00393-200
25	1	22-05-7048 J4	4PINMOLEX	.100"	610-00601-004
26 B	1	GAL22V10-25P U121	UARTCTLA	25NS	120-00001-021
27	1	Z85C30-10JC U159	SMT UART		240-00001-400
28 D*	1	AM27C256-95DC U135	32Kx8EPROM 29KBK1B3.001	90NS	110-00001-118
29 D*	1	AM27C256-95DC U115	32Kx8EPROM 29KBK1B1.001	90NS	110-00001-119
30 D*	1	AM27C256-95DC U108	32Kx8EPROM 29KBK1B0.001	90NS	110-00001-120
31 D*	1	AM27C256-95DC U127	32Kx8EPROM 29KBK1B2.001	90NS	110-00001-121
32 D*	1	AM27C256-95DC U134	32Kx8EPROM 29KBK0B3.001	90NS	110-00001-122
33 D*	1	AM27C256-95DC U114	32Kx8EPROM 29KBK0B1.001	90NS	110-00001-123
34 D*	1	AM27C256-95DC U107	32Kx8EPROM 29KBK0B0.001	90NS	110-00001-124
35 D*	1	AM27C256-95DC U126	32Kx8EPROM 29KBK0B2.001	90NS	110-00001-125
36	8	SN74AS373DW U38,U39,U47,U48,U60,U61,U62,U63	SMT OCTD-LATCHES		201-00373-100

ITEM	QTY	PART NUMBER REF. DES.	PART DESCRIP	VALUE	MPG P/N
37	B 1	GAL22V10-15P U138	ROMADLDA	15NS	120-00001-016
38	B 1	GAL22V10-15P U136	STATEM2A	15NS	120-00001-017
39	4	AM29C863APC U2,U3,U11,U12	9BIBUSDRVR		235-00005-200
40	3	SN74ALS2540N U82,U92,U100	OCTINVDRVR		200-02540-200
41	A 1	GAL16V8A-15P U116	RAMCNTLB	15NS	120-00001-123
42	5	SN74AS258N U83,U93,U101,U129,U131	QUAD2:1MUX		201-00258-200
43	2	AM29C821APC U75,U76	10BITREGISTER		235-00003-200
44	1	SN74AS175N U84	QUADDFLOPS		201-00175-200
45	11	74F269SC U68,U78,U85,U103,U110,U133,U178,U179,U180,U184,U185	SMTDECADEU/DCNTR		203-00269-100
46	B 1	GAL22V10-15P U109	RAMADLDA	15NS	120-00001-018
47	B 1	GAL22V10-15P U102	STATEMB	15NS	120-00001-119
48	A 1	GAL16V8A-15P U67	29DECODA	15NS	120-00001-024
49	* 16	TMS44C256-12NL U13,U21,U27,U34,U35,U37,U46,U57,U80,U81,U88,U89,U90,U91,U98,U99	256Kx4DRAM	120NS	220-00002-212
50	4	SN74AS245DW U43,U44,U52,U53	SMT OCTBIBUFFER		201-00245-100
51	1	SA101A221JAA C203	AXCERCAP	220PF	402-00195-221
52	1	SN74ALS1010N U20	TRI3INNAND		200-01010-200
53	35	SN74AS244DW U6,U7,U8,U14,U15,U16,U22,U23,U24,U28,U29,U30,U31,U36, U40,U41,U42,U45,U49,U50,U51,U54,U56,U64,U65,U66,U72,U73, U74,U95,U132,U144,U145,U150,U151,[U77]	SMT OCTBUFFERS		201-00244-100

ITEM	QTY	PART NUMBER	PART DESCRIP	VALUE	MPG P/N
		REF. DES.			
54	B 1	GAL22V10-15P U59	CLFIFOA	15NS	120-00001-020
55	F* 1	AM29000-16GC U9	MICROPROCESSOR	16MHZ	135-29000-516
56					
57	1	SN7407N U130	HEXOCDRIVERS		206-00007-200
58	A 1	GAL16V8A-25P U122	INTRACKB	25NS	120-00001-026
59					
60					
61	6	CCF-07 561G R2,R7,R8,R13,R14,R16	2%MFRES	560OHM	503-00002-561
62	2	SN74AS74N [U18],U147,U161	DUALDFLOPS		201-00074-200
63	[0]	X0-43D-24 [U17]	OSCILLATOR	24MHZ	290-00001-024
64	4	836C102X2PE U4,U5,U120,U124	SMTPLRESPAK	1KOHM	502-00001-102
65	6	CCF-07 100G [R3],R11,R12,R15,R17,R23,R24	2%MFRES	100OHM	503-00002-100
66	1	68001-503 [J3],J5	3PINJUMPER	.100"	610-00002-003
67	4	CCF-07 102G [R1,R4,R5],R9,R10,R19,R25	2%MFRES	1KOHM	503-00002-102
68	2	CCF-07 103G R6 ,R22	2%MFRES	10KOHM	503-00002-103
69	1	CCF-07 104G R20	2%MFRES	100KOHM	503-00002-104
70	1	1N914 D1	DIODE		300-00002-003
71	1	1N746A D2	ZENER	3.3V	301-00002-033
72	1	LM311N Q1	VOLTCOMPAR		280-00002-200

ITEM	QTY	PART NUMBER REF. DES.	PART DESCRIP	VALUE	MPG P/N
73	1	KSA1A211 SW1	PBSWITCH		625-00002-001
74	1	173D335X0020V C159	AXTANTCAP	3.3UF	422-00062-335
75	1	X0-43D-20 U168	OSCILLATOR	20MHZ	290-00001-020
76	1	X0-43D-32 U142	OSCILLATOR	32MHZ	290-00001-032
77	3	SN74AS1004AN [U25],U19,U119,U156	HEXINVDRIVRS		201-01004-200
78	3	HLMP3600 D3,D4,D5	LED	RED	305-00003-002
79	1	ICTE-5 D6	ZENER		300-00001-002
80	10	7-0805G-5 TP5,TP4,TP3,TP2,TP1,TP6,TP7,TP8,TP9,TP10	TESTPIN		710-00001-001
81	1	26-64-5100	MOLEX10PIN	.156"	610-00601-010
	0	09-52-3101 P3	MOLEX10PIN	.156"	610-10600-010
82	8	TAJJC156M010R C5,C51,C59,C102,C124,C187,C199,C200	SMTTANTCAP	15UF	420-00002-156
83	41	11C1210Z5U334M050NT C112,C113,C185,C104,C177,C173,C164,C161,C160,C156,C153, C146,C145,C144,C141,C140,C132,C131,C125,C123,C96,C95, C94,C93,C86,C85,C53,C49,C39,C34,C33,C31,C27, C23,C18,C14,C10,C105,C28,C32,C50	SMTCERCAP	0.33UF	401-02000-334
84	146	11C1206Z5U104M050NT C11,C16,C193,C128,C183,C150,C118,C90,C67,C9,C8,C7,C6,C4, C3,C2,C1,C41,C12,C13,C15,C194,C195,C196,C197,C198, C163,C184,C186,C189,C190,C191,C192,C99,C89,C88,C87,C84, C83,C82,C81,C80,C182,C181,C180,C179,C178,C172,C171,C170, C169,C168,C167,C166,C165,C162,C158,C157,C155,C154,C152, C151,C149,C148,C147,C143,C142,C138,C137,C136,C135,C134, C133,C130,C129,C127,C126,C122,C121,C120,C119,C117,C116, C115,C114,C111,C110,C109,C108,C107,C106,C103,C101,C98, C97,C92,C91,C79,C78,C77,C76,C75,C74,C72,C71,C70,C69,C68, C66,C65,C64,C63,C62,C61,C60,C58,C57,C56,C55,C52,C54,C48, C47,C46,C45,C44,C43,C42,C40,C38,C37,C36,C35,C30,C29,C26, C25,C24,C22,C21,C20,C19,C17,C73,C139,C100	SMTCERCAP	0.1UF	401-01000-104
85	1	92984-2-01-20-30 P2	2x20HEADER	.100"	610-10100-040

ITEM	QTY	PART NUMBER REF. DES.	PART DESCRIP	VALUE	MPG P/N
86	1	92984-2-01-32-30 P1	2x32HEADER	.100"	610-10100-064
87	A [0]	ICO-320-MTT [UX67,UX116,UX117,UX122]	.3x20PIN SOCKET		600-00001-320
88	B [0]	ICO-324-MTT [UX59,UX70,UX79,UX102,UX104,UX109,UX111,UX118,UX121, UX136,UX138]	.3x24PIN SOCKET		600-00001-324
89	C [0]	110-13-328-41-001 [UX55,UX166,UX173]	.3x28PIN SOCKET		600-00001-328
90	D 8	ICO-628-MTT UX107,UX108,UX114,UX115,UX126,UX127,UX134,UX135	.6x28PIN SOCKET		600-00001-628
91	E 4	2-644018-2 UX153,UX154,UX160,UX167	.6x32PIN SOCKET		600-00003-632
92	F 1	CPAS-169-ZSTT UX9, [UX149]	169PINPGASOCKET		601-00002-169
93	[0]	SRS8-12-01	SPACER	.750"	700-00001-003
94	2	68786-102	SHUNT		715-00001-001
95	1	CCF-07 820G R21	2PCMFRES	82OHM	503-00002-820
96	1	FRJ-50 R18	JUMPRES	0OHM	503-00001-000
96	1	C410C104M5U5CA C201	AXCERCAP	.1UF	402-00382-104
97	C* 1	EPS448-3P U166	MAC.2 SAM	20MHZ	115-00001-002
98	C* 1	EPS448-3P U173	MAC.1 SAM	20MHZ	115-00001-001
99	1	C410C101J1R5CA C202	AXCERCAP	100PF	402-00195-101

425

NOTES:

1. PARTS ERQUIRING 0.33UF DECOUPLING CAPACITORS ARE DESIGNATED WITH AN ASTERISK (*) BETWEEN ITEM AND QTY COLUMNS.
2. PARTS REQUIRING SOCKETS ARE MARKED WITH A LETTER CORRESPONDING TO THE SOCKETS (SOCKETS ARE ITEMS 87 - 92).
3. PARTS WITH REFERENCE DESIGNATORS IN BRACKETS [] WILL MOT BE POPULATED DURING PRODUCTION.

VIDEO GRAPHICS
PRINTED CIRCUIT
BOARD ASSEMBLY
(with VCLIPPERS)

[illegible]

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER	DATE	MICROPROSE GAMES	
DAVID J. BELLAMY		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER	DATE	TITLE	
		V V G B	
ENGINEER	DATE	PRINT CIRCUIT BOARD ASSEMBLY	
DOUGLAS FROME			
APPROVAL	DATE	SIZE	DRAWING NUMBER
<i>D. Frome</i>	1/4/91	C	DW-00011C-0013-03
APPROVAL	DATE	REV	RELEASE
<i>D. Banks</i>	1/5/91	A	
		DATE 11-20-1990 13:08	SHEET 1 OF 27

POWER
ON



4

3

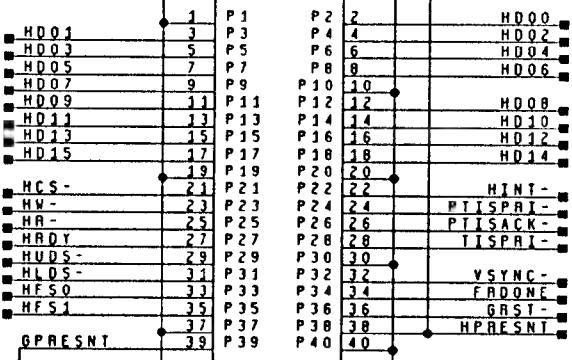
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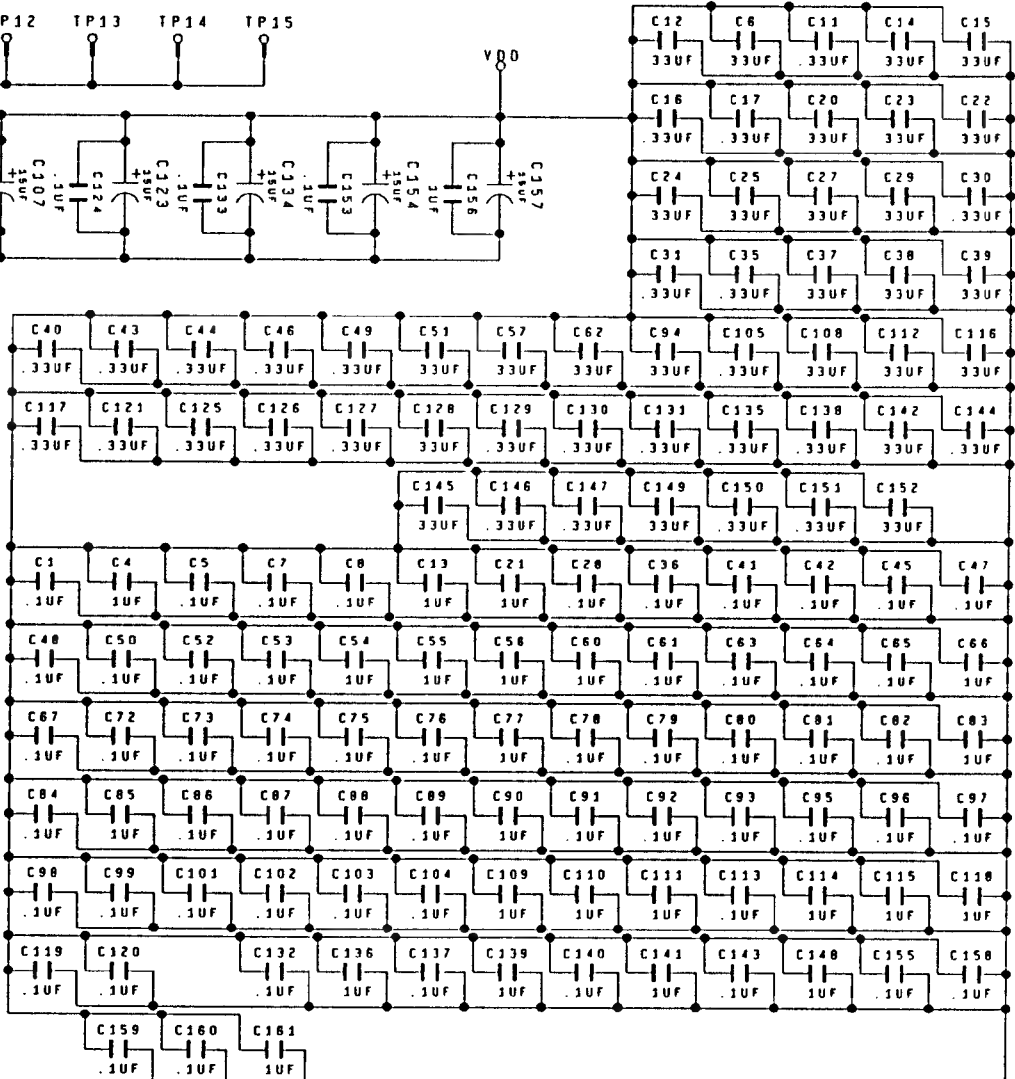
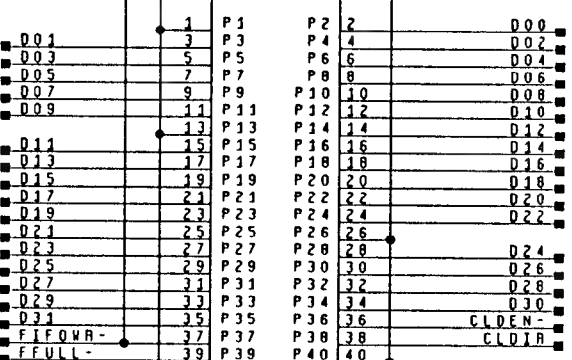
TP6 TP7 TP8 TP9 TP10 TP11 TP12 TP13 TP14 TP15

VDD

HOST
PROCESSOR
(MC68000)
BOARD



DR. MATH
(AM29000)
BOARD



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MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY	DATE 1/14/91
CHECKER	DATE
ENGINEER DOUGLAS FROME	DATE 1/14/91
APPROVAL <i>[Signature]</i>	DATE 1/14/91

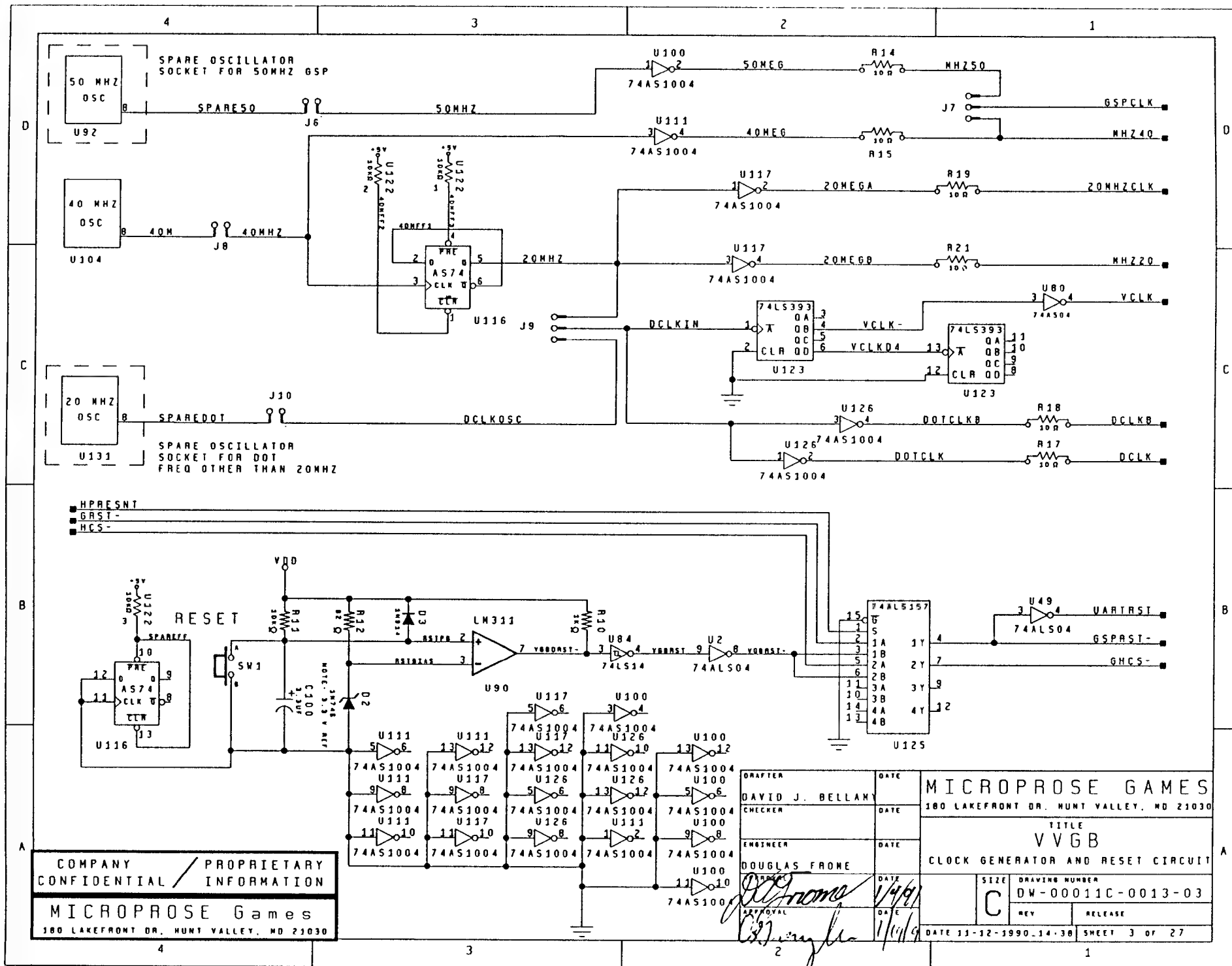
MICROPROSE GAMES 180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
TITLE V VGB BOARD INTERCONNECTION AND POWER DECOUPLING	
SIZE C	DRAWING NUMBER DW-00011C-0013-03
REV	RELEASE
DATE 11-13-1990.13-52 SHEET 2 OF 27	

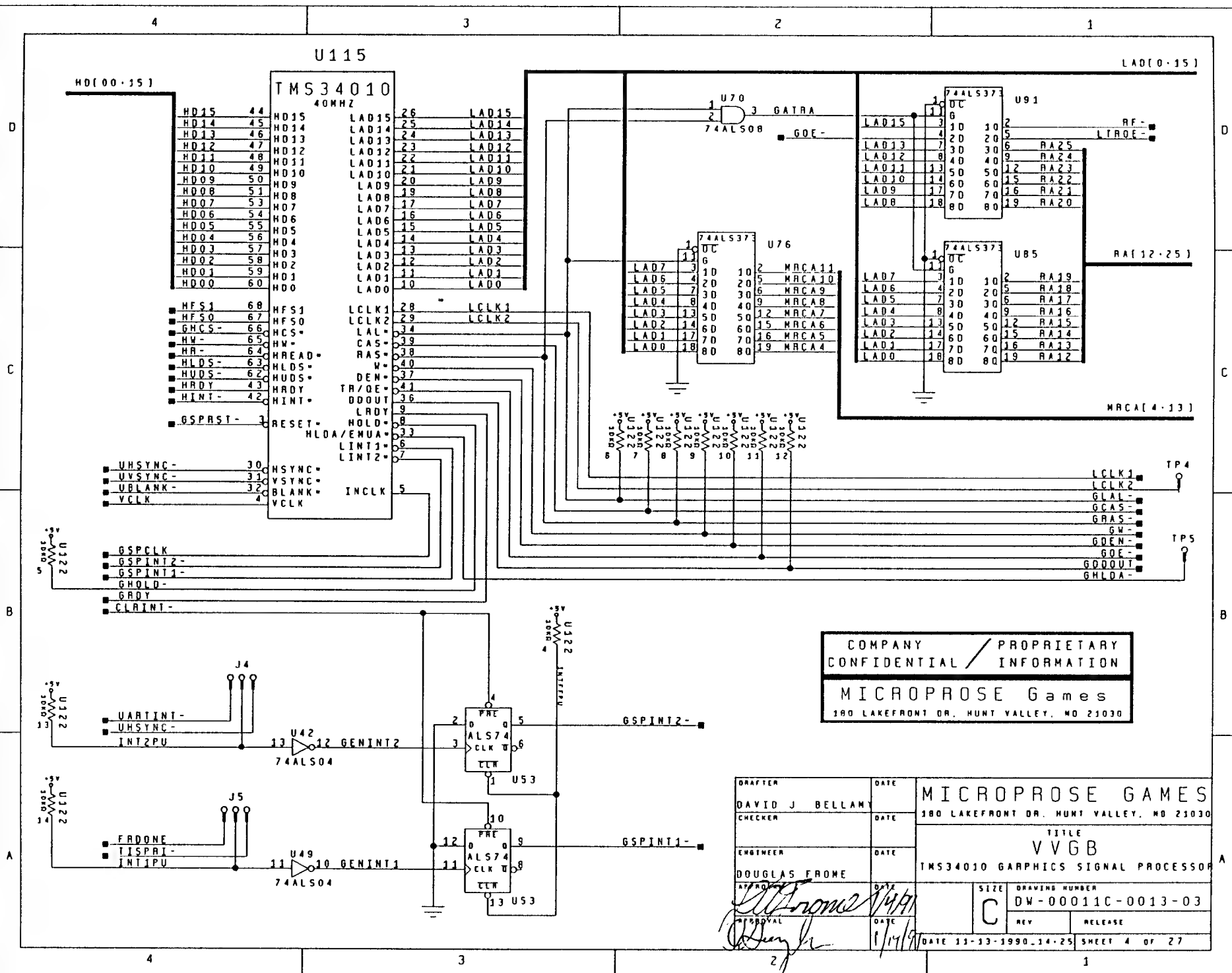
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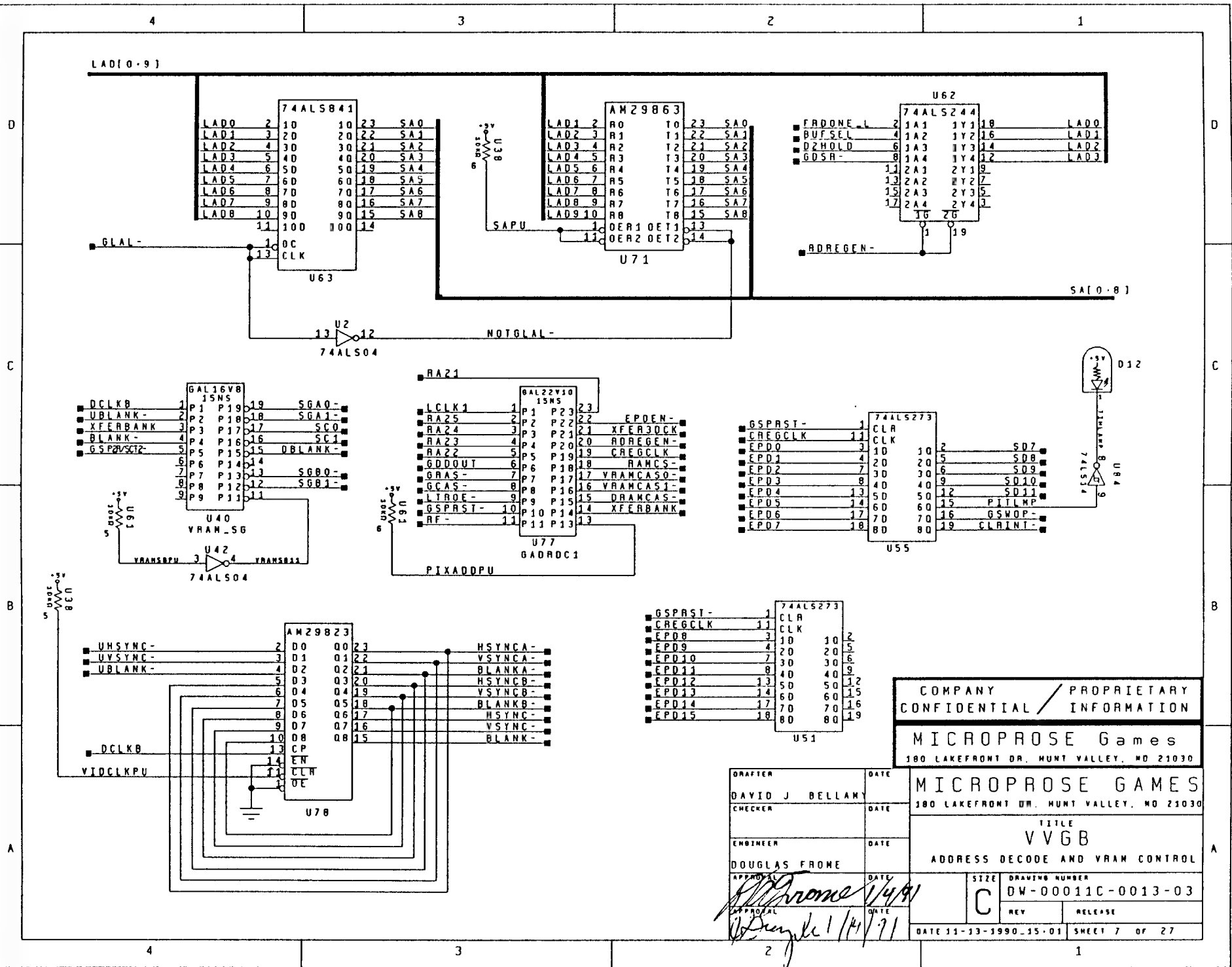
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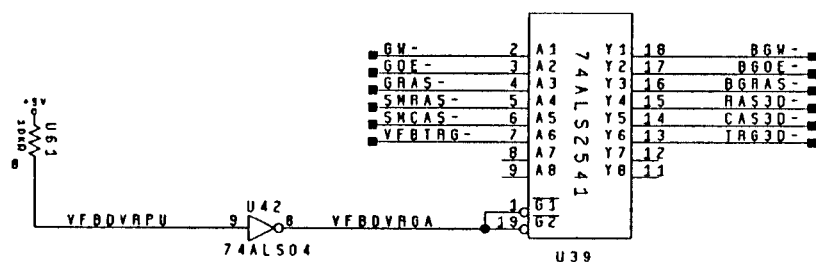
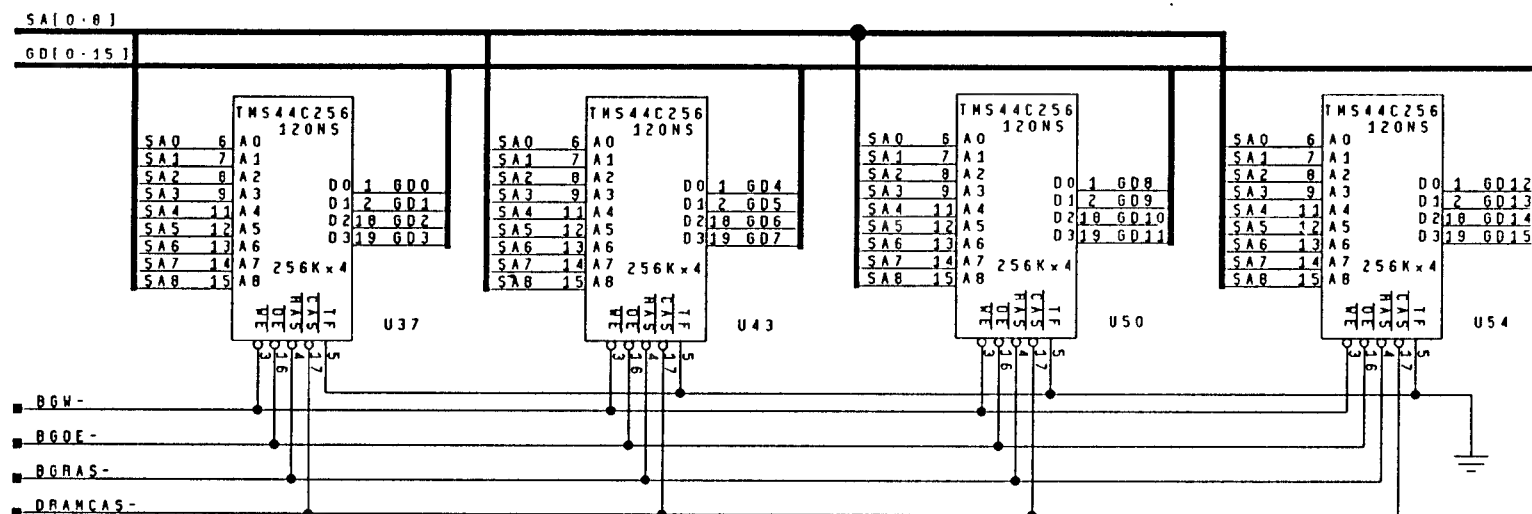




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MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY		DATE	
CHECKER		DATE	
ENGINEER DOUGLAS FROME		DATE	
APPROVAL <i>[Signature]</i> 1/4/91		DATE	
APPROVAL <i>[Signature]</i> 1/4/91		DATE	
TITLE VVGB ADDRESS DECODE AND VRAM CONTROL		SIZE C	
DRAWING NUMBER DW-00011C-0013-03		REV	
DATE 11-13-1990-15-01		SHEET 7 OF 27	

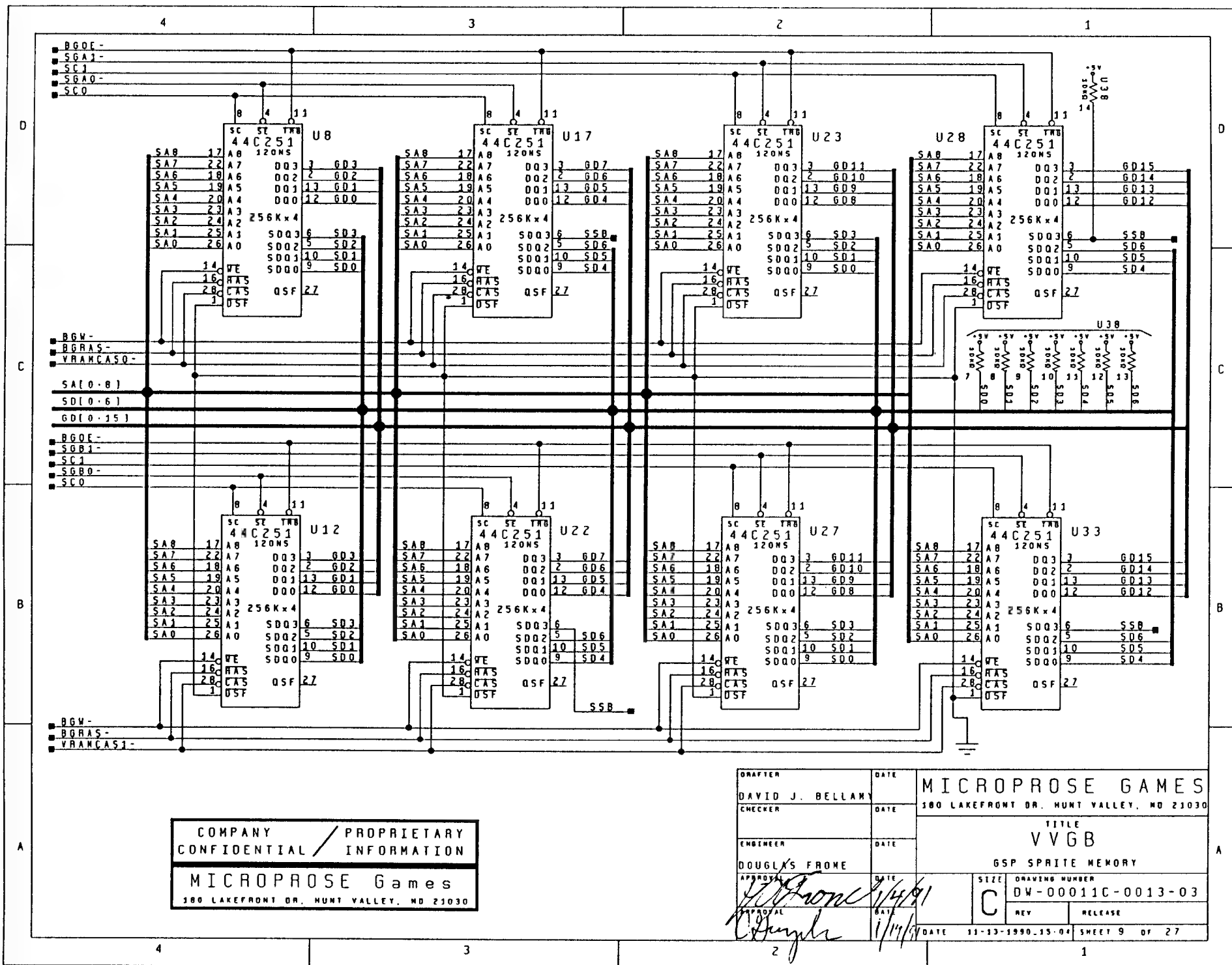


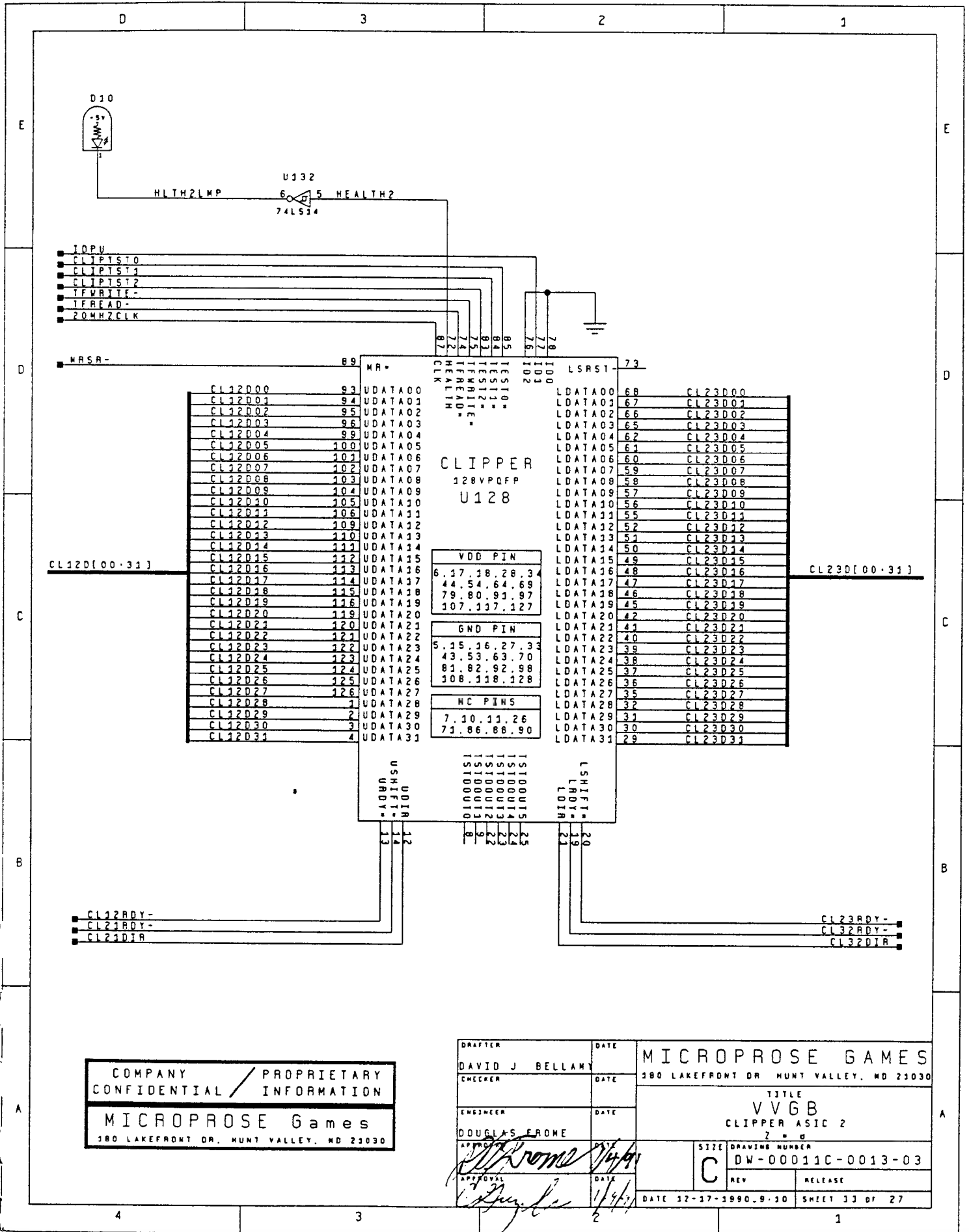
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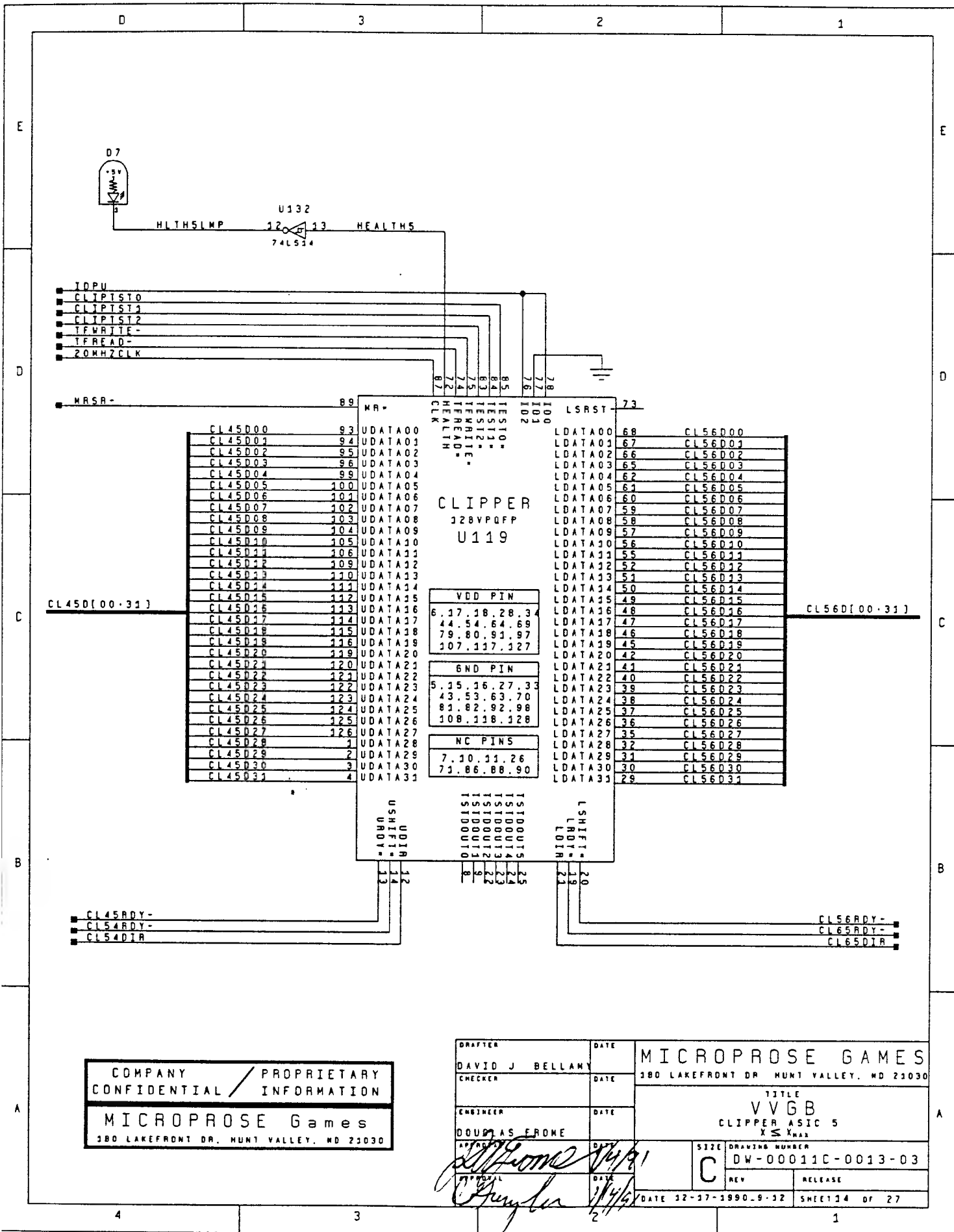
MICROPROSE Games

180 LAKEFRONT DR. MOUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY		DATE		MICROPROSE GAMES	
CHECKER		DATE		180 LAKEFRONT DR. MOUNT VALLEY, MD 21030	
ENGINEER		DATE		TITLE V VGB	
DOUGLAS FROME		DATE		GSP DRAM BANK	
APPROVAL		DATE		SIZE C	
DATE 11-13-1990		DATE 11/1/91		DRAWING NUMBER DW-00011C-0013-03	
DATE 11-13-1990		DATE 11/1/91		REV 1	
DATE 11-13-1990		DATE 11/1/91		RELEASE	
DATE 11-13-1990		DATE 11/1/91		SHEET 8 OF 27	

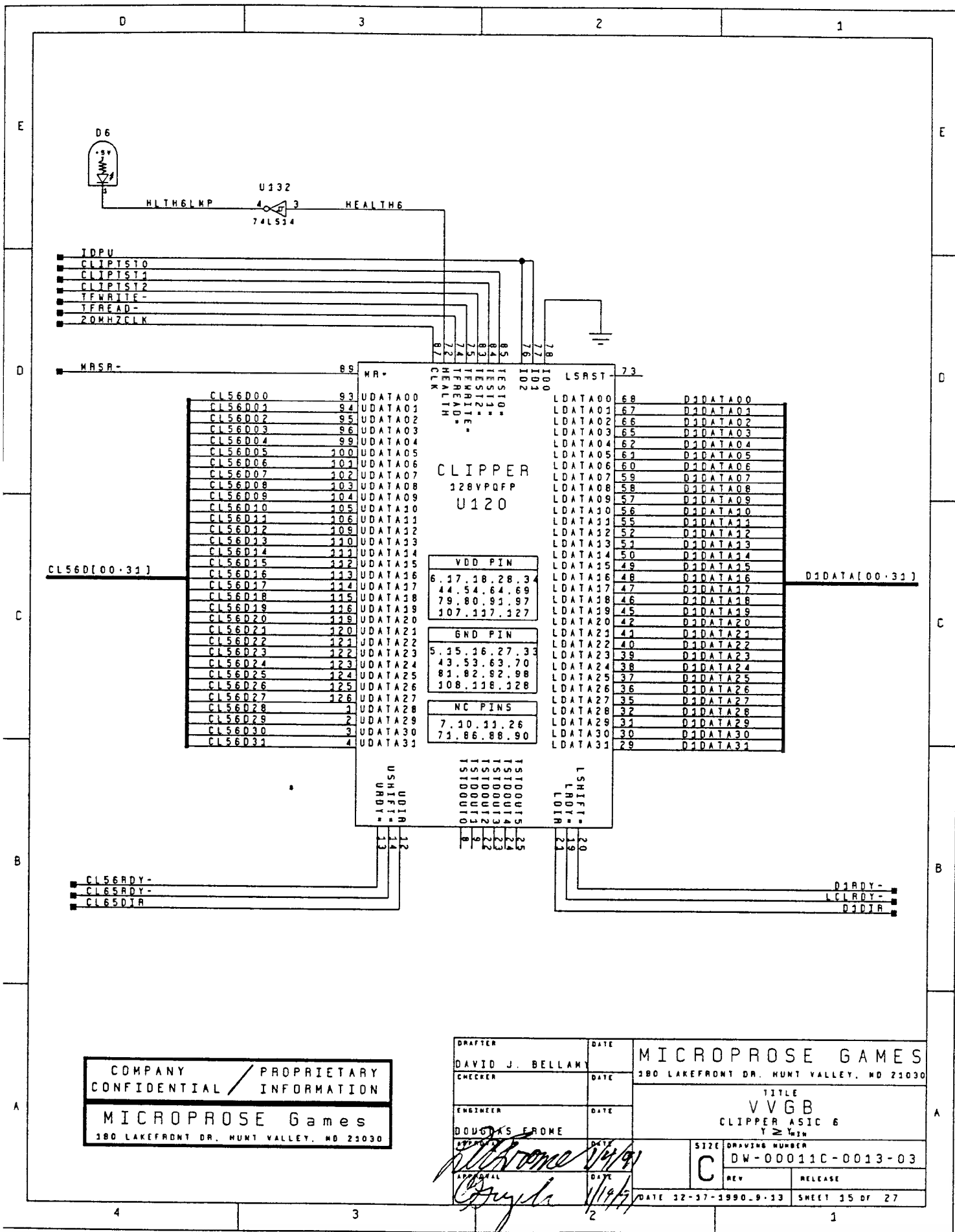


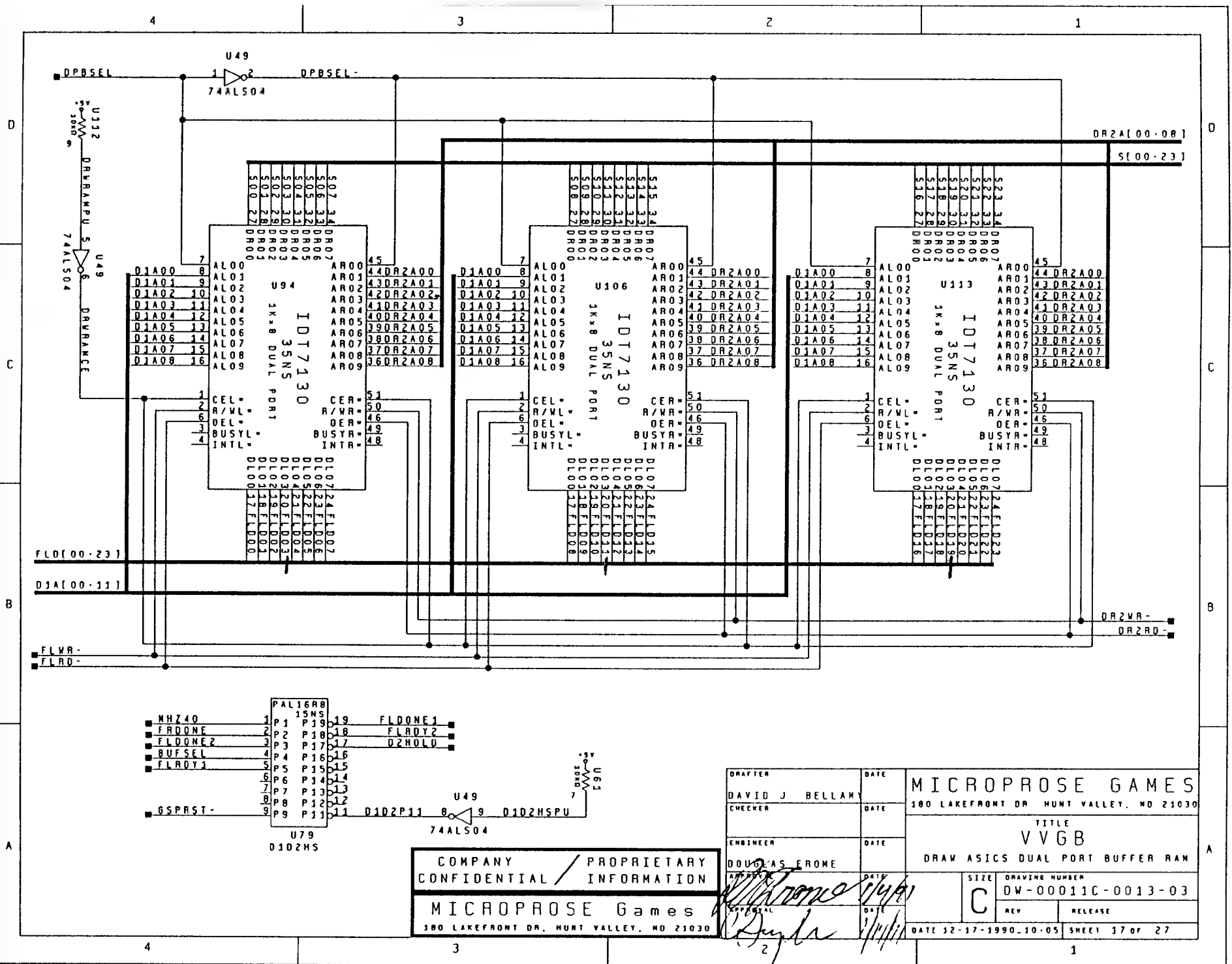


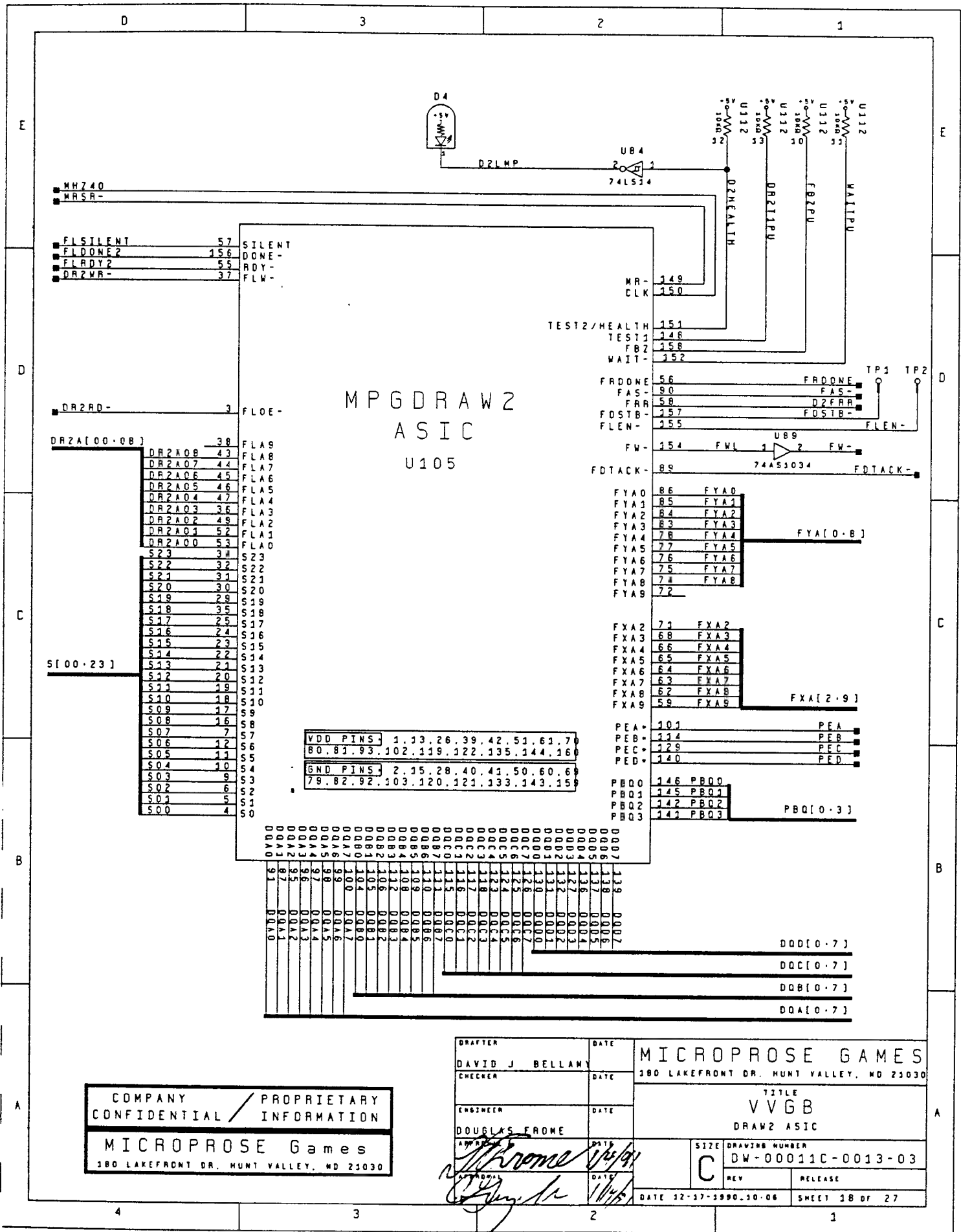


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MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER		DATE		MICROPROSE GAMES	
DAVID J. BELLAMY				180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER		DATE		TITLE	
				V V G B	
ENGINEER		DATE		CLIPPER ASIC 5	
DOUGLAS EROME				X ≤ X _{MAX}	
APPROVAL		DATE		DRAWING NUMBER	
<i>[Signature]</i>		11/4/91		DW-00011C-0013-03	
REV		DATE		RELEASE	
1		11/4/91		DATE 12-17-1990-9-32 SHEET 14 OF 27	







COMPANY CONFIDENTIAL / PROPRIETARY INFORMATION
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER		DATE		MICROPROSE GAMES	
DAVID J. BELLAMY				180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER		DATE		TITLE	
				V V G B	
ENGINEER		DATE		DRAW2 ASIC	
DOUGLAS FROHE				DRAWING NUMBER	
APPROVAL		DATE		DW-00011C-0013-03	
APPROVAL		DATE		REV	
				RELEASE	
				DATE 12-17-1990.10.06	
				SHEET 18 OF 27	

DQC[0..7]

DOB[0..7]

DOA[0..7]

U83

DOA0	2	1A1	1Y1	18	BDQA0
DOA1	4	1A2	1Y2	16	BDQA1
DOA2	6	1A3	1Y3	14	BDQA2
DOA3	8	1A4	1Y4	12	BDQA3
DOA4	11	2A1	2Y1	9	BDQA4
DOA5	13	2A2	2Y2	7	BDQA5
DOA6	15	2A3	2Y3	5	BDQA6
DOA7	17	2A4	2Y4	3	BDQA7

U75

DOB0	2	1A1	1Y1	18	BDQB0
DOB1	4	1A2	1Y2	16	BDQB1
DOB2	6	1A3	1Y3	14	BDQB2
DOB3	8	1A4	1Y4	12	BDQB3
DOB4	11	2A1	2Y1	9	BDQB4
DOB5	13	2A2	2Y2	7	BDQB5
DOB6	15	2A3	2Y3	5	BDQB6
DOB7	17	2A4	2Y4	3	BDQB7

U68

DQC0	2	1A1	1Y1	18	BDQC0
DQC1	4	1A2	1Y2	16	BDQC1
DQC2	6	1A3	1Y3	14	BDQC2
DQC3	8	1A4	1Y4	12	BDQC3
DQC4	11	2A1	2Y1	9	BDQC4
DQC5	13	2A2	2Y2	7	BDQC5
DQC6	15	2A3	2Y3	5	BDQC6
DQC7	17	2A4	2Y4	3	BDQC7

BDQC[0..7]

BDQB[0..7]

BDQA[0..7]

PBQ[0..3]

DOD[0..7]

U59

DOD0	2	1A1	1Y1	18	BDQD0
DOD1	4	1A2	1Y2	16	BDQD1
DOD2	6	1A3	1Y3	14	BDQD2
DOD3	8	1A4	1Y4	12	BDQD3
DOD4	11	2A1	2Y1	9	BDQD4
DOD5	13	2A2	2Y2	7	BDQD5
DOD6	15	2A3	2Y3	5	BDQD6
DOD7	17	2A4	2Y4	3	BDQD7

U47

BDQ0	2	1A1	1Y1	18	PBQ0
BDQ1	4	1A2	1Y2	16	PBQ1
BDQ2	6	1A3	1Y3	14	PBQ2
BDQ3	8	1A4	1Y4	12	PBQ3
PBQ0	11	2A1	2Y1	9	BDQ0
PBQ1	13	2A2	2Y2	7	BDQ1
PBQ2	15	2A3	2Y3	5	BDQ2
PBQ3	17	2A4	2Y4	3	BDQ3

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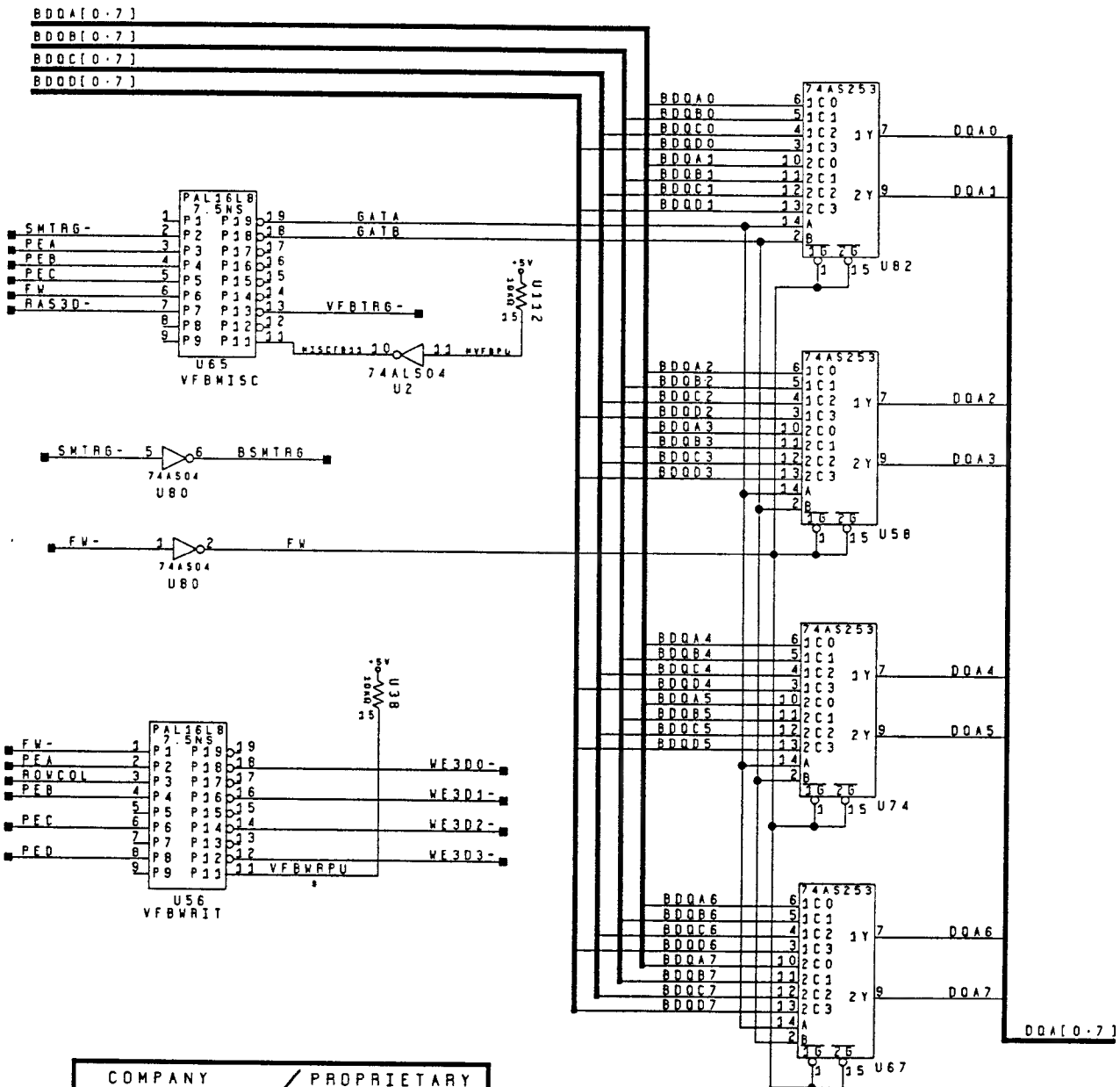
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MICROPROSE Games

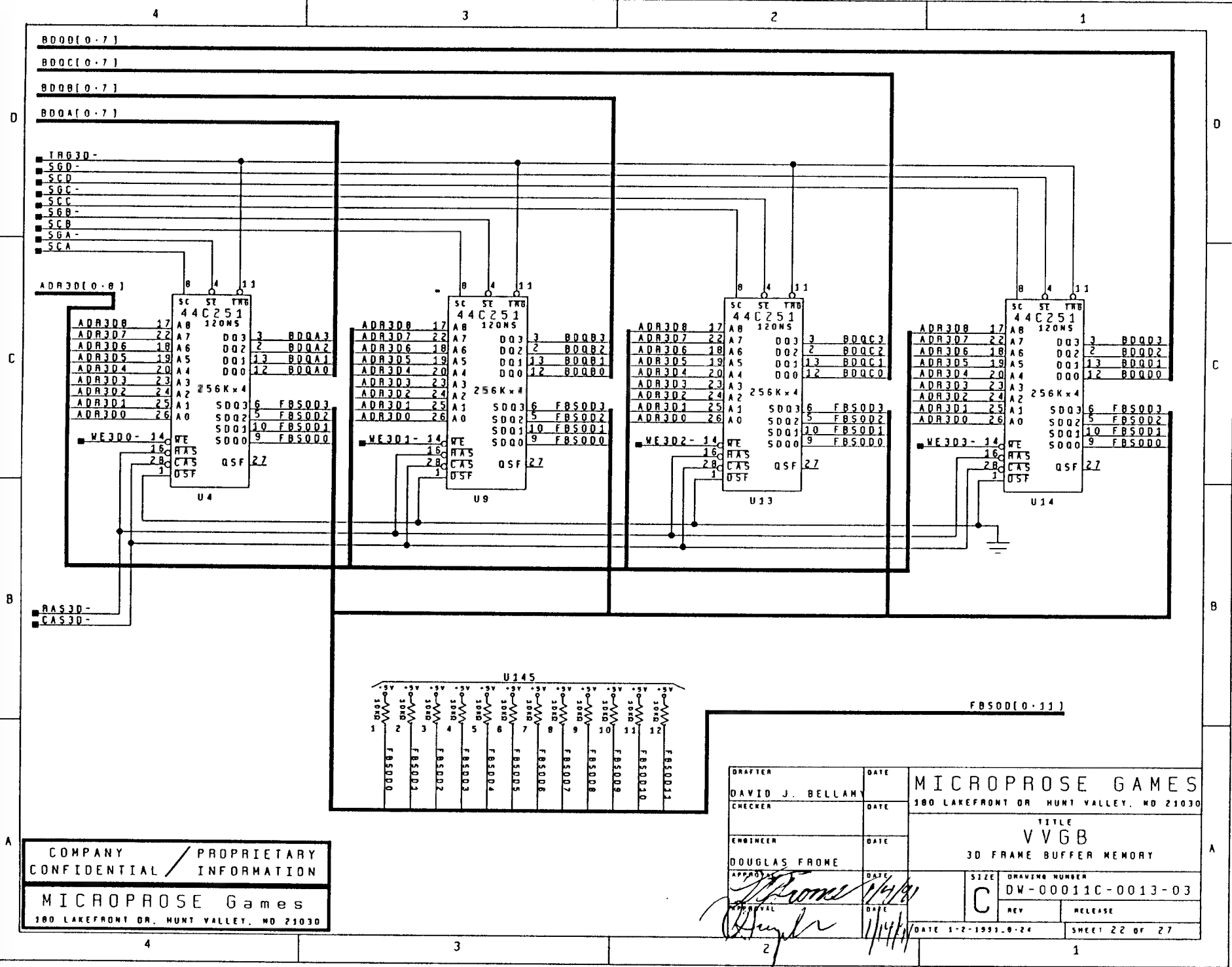
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY	DATE	MICROPROSE GAMES	
CHECKER	DATE	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER DOUGLAS FRONE	DATE	TITLE VVGB	
APPROVAL <i>[Signature]</i>	DATE 1/14/91	30 FRAME DATA BUS BUFFERS	
APPROVAL <i>[Signature]</i>	DATE 1/14/91	SIZE C	DRAWING NUMBER DW-00011C-0013-03
		REV	RELEASE
		DATE 12-17-1990-10-07 SHEET 20 OF 27	



COMPANY CONFIDENTIAL / PROPRIETARY INFORMATION
MICROPROSE Games
 380 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY		DATE 1/14/91		MICROPROSE GAMES 380 LAKEFRONT DR. HUNT VALLEY, MD 21030	
CHECKER		DATE		TITLE VVGB	
ENGINEER DOUGLAS EBONE		DATE		VIDEO FRAME BUFFER READBACK	
APPROVAL <i>[Signature]</i>		DATE 1/14/91		SIZE C	
APPROVAL <i>[Signature]</i>		DATE 1/14/91		DRAWING NUMBER DW-00011C-0013-03	
DATE 12-17-1990-10-09				SHEET 21 OF 27	



COMPANY / PROPRIETARY
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MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER DAVID J. BELLAMY		DATE	
CHECKER		DATE	
ENGINEER		DATE	
DOUGLAS FROME		DATE	
APPROVAL <i>[Signature]</i>		DATE 1/4/91	
DATE 1/4/91		DATE	
MICROPROSE GAMES 180 LAKEFRONT DR. HUNT VALLEY, MD 21030			
TITLE VVG8 3D FRAME BUFFER MEMORY			
SIZE C		DRAWING NUMBER DW-00011C-0013-03	
REV		RELEASE	
DATE 1-2-1991-0-24		SHEET 22 OF 27	

B000[0..7]

B00C[0..7]

B00B[0..7]

B00A[0..7]

TR63D-

SGD-

SCD-

SQC-

SCC-

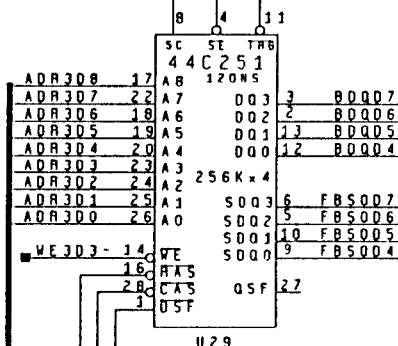
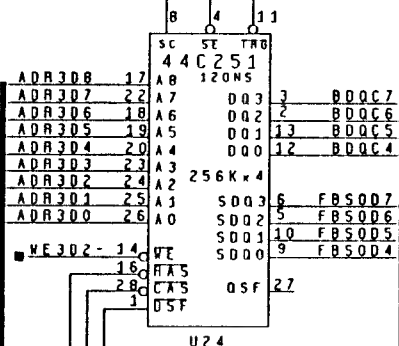
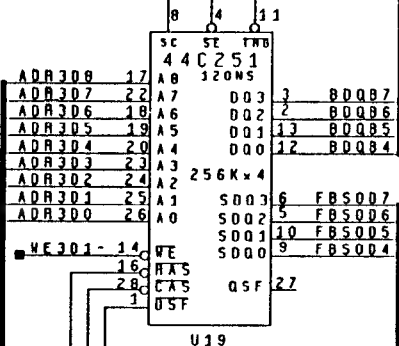
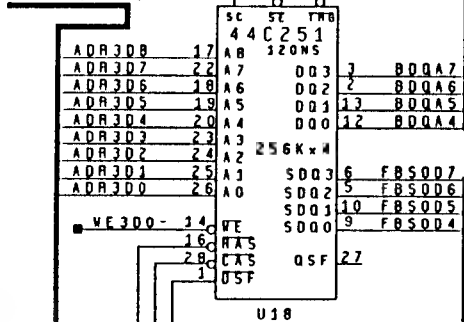
SGB-

SCB-

SGA-

SCA-

ADR30[0..8]



RAS3D-

CAS3D-

FBS00[0..11]

COMPANY / PROPRIETARY
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MICROPROSE Games

180 LAKEFRONT DR. HUNT VALLEY, MO 21030

DRAFTER		DATE		MICROPROSE GAMES	
DAVID J. BELLAMY					
CHECKER		DATE		180 LAKEFRONT DR. HUNT VALLEY, MO 21030	
ENGINEER		DATE		TITLE	
DOUGLAS FROME				V VGB	
APPROVAL		DATE		3D FRAME BUFFER MEMORY	
APPROVAL		DATE		SIZE	
DW		1/14/91		DRAWING NUMBER	
DW		1/14/91		DW-00011C-0013-03	
DATE		1-2-1991-8-33		REV	
				RELEASE	
				SHEET 23 OF 27	

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MICROPROSE Games

180 LAKEFRONT DR. HUNT VALLEY, MD 21030

B00(0.3)

TRG3D-
SGD-
SCD-
SCC-
SOB-
SCB-
SGA-
SCA-

ADR3D(0.8)

ADR3D8	17	SC	44C251	120MS
ADR3D7	22	A7	003	3 B0Q3
ADR3D6	18	A6	002	2 B0Q2
ADR3D5	19	A5	001	13 B0Q1
ADR3D4	20	A4	000	12 B0Q0
ADR3D3	23	A3	256Kx4	
ADR3D2	24	A2		
ADR3D1	25	A1	S0Q3	6 FBS0011
ADR3D0	26	A0	S0Q2	5 FBS0010
			S0Q1	10 FBS009
			S0Q0	9 FBS008

WE3D0- 14 WE
16 RAS
28 CAS
1 USF
OSF 27

U30

ADR3D8	17	SC	44C251	120MS
ADR3D7	22	A7	003	3 B0Q3
ADR3D6	18	A6	002	2 B0Q2
ADR3D5	19	A5	001	13 B0Q1
ADR3D4	20	A4	000	12 B0Q0
ADR3D3	23	A3	256Kx4	
ADR3D2	24	A2		
ADR3D1	25	A1	S0Q3	6 FBS0011
ADR3D0	26	A0	S0Q2	5 FBS0010
			S0Q1	10 FBS009
			S0Q0	9 FBS008

WE3D1- 14 WE
16 RAS
28 CAS
1 USF
OSF 27

U34

ADR3D8	17	SC	44C251	120MS
ADR3D7	22	A7	003	3 B0Q3
ADR3D6	18	A6	002	2 B0Q2
ADR3D5	19	A5	001	13 B0Q1
ADR3D4	20	A4	000	12 B0Q0
ADR3D3	23	A3	256Kx4	
ADR3D2	24	A2		
ADR3D1	25	A1	S0Q3	6 FBS0011
ADR3D0	26	A0	S0Q2	5 FBS0010
			S0Q1	10 FBS009
			S0Q0	9 FBS008

WE3D2- 14 WE
16 RAS
28 CAS
1 USF
OSF 27

U35

ADR3D8	17	SC	44C251	120MS
ADR3D7	22	A7	003	3 B0Q3
ADR3D6	18	A6	002	2 B0Q2
ADR3D5	19	A5	001	13 B0Q1
ADR3D4	20	A4	000	12 B0Q0
ADR3D3	23	A3	256Kx4	
ADR3D2	24	A2		
ADR3D1	25	A1	S0Q3	6 FBS0011
ADR3D0	26	A0	S0Q2	5 FBS0010
			S0Q1	10 FBS009
			S0Q0	9 FBS008

WE3D3- 14 WE
16 RAS
28 CAS
1 USF
OSF 27

U41

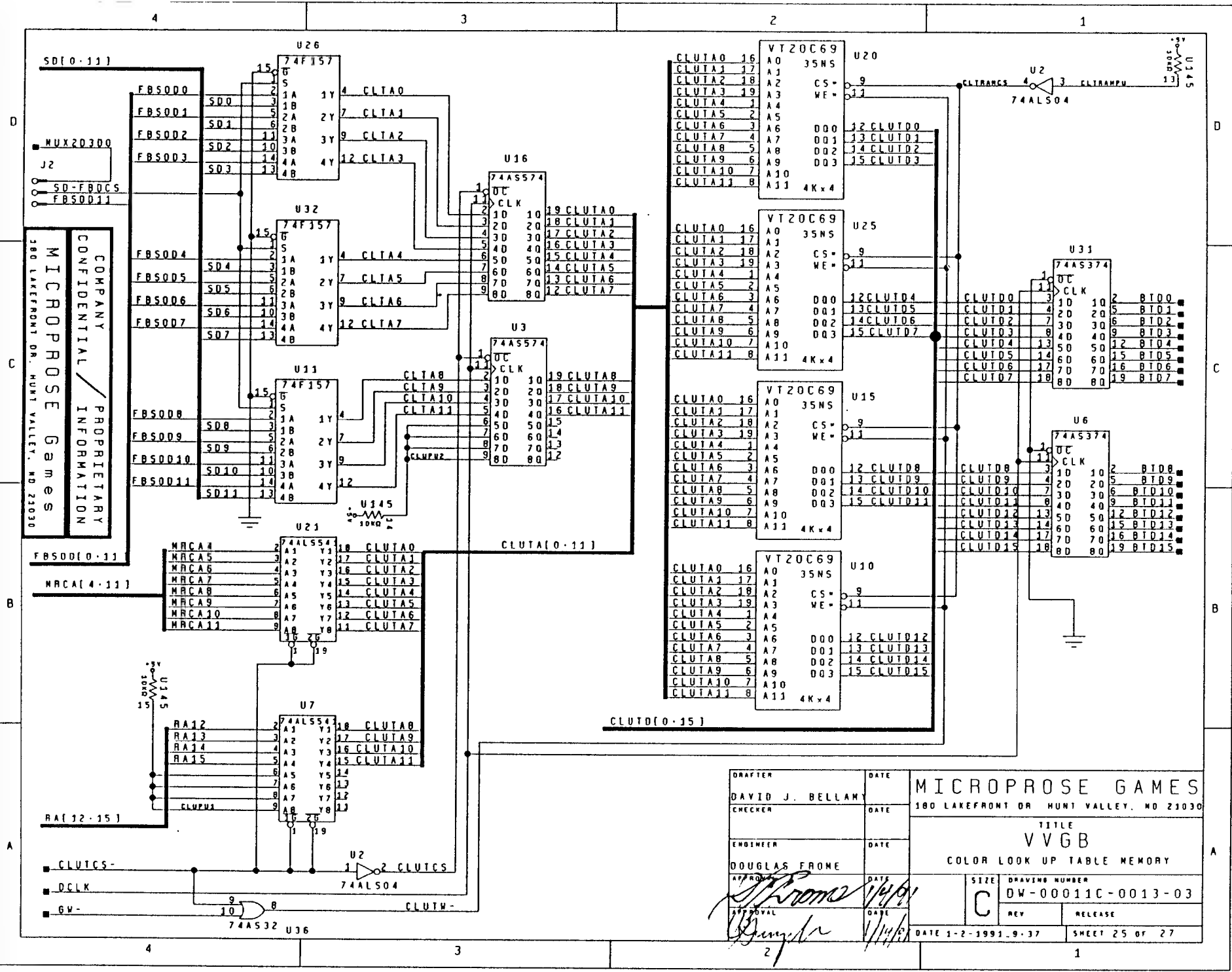
RAS3D-
CAS3D-

FBS00(0.11)

SSB	1	PAL16L8	19	MUX2D300
FBS008	2	P1 5NS	18	
FBS009	3	P2 P19	17	
FBS0010	4	P3 P17	16	
FBS0011	5	P4 P16	15	
	6	P5 P15	14	
	7	P6 P14	13	
	8	P7 P13	12	
	9	P8 P12	11	
	10	P9 P11	10	

U48
MUX2D30A

DRAWN BY DAVID J. BELLAMY		DATE 1/4/91	MICROPROSE GAMES	
CHECKED BY DOUGLAS FROME		DATE 1/11/91	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER DOUGLAS FROME		DATE 1/11/91	TITLE VVGB	
APPROVED BY DOUGLAS FROME		DATE 1/11/91	3D FRAME BUFFER MEMORY	
APPROVAL DOUGLAS FROME		DATE 1/11/91	SIZE C	DRAWING NUMBER DW-00011C-0013-03
		DATE 11-13-1990-17-48	REV	RELEASE
			SHEET 24 OF 27	



DRAFTER		DATE	
DAVID J. BELLAMY			
CHECKER		DATE	
ENGINEER		DATE	
DOUGLAS FROME			
APPROVAL		DATE	
<i>[Signature]</i>		1/14/91	
APPROVAL		DATE	
<i>[Signature]</i>		1/14/91	
MICROPROSE GAMES			
180 LAKEFRONT DR. HUNT VALLEY, MD 21030			
TITLE			
VVGB			
COLOR LOOK UP TABLE MEMORY			
SIZE		DRAWING NUMBER	
C		DW-00011C-0013-03	
REV		RELEASE	
DATE 1-2-1991.9-37		SHEET 25 OF 27	

CLDATA[00:31]

CLDATA04	2	1A1	1Y1	18	D04
CLDATA05	4	1A2	1Y2	16	D05
CLDATA06	6	1A3	1Y3	14	D06
CLDATA07	8	1A4	1Y4	12	D07
CLDATA00	11	2A1	2Y1	9	D00
CLDATA01	13	2A2	2Y2	7	D01
CLDATA02	15	2A3	2Y3	5	D02
CLDATA03	17	2A4	2Y4	3	D03

CLDATA12	2	1A1	1Y1	18	D12
CLDATA13	4	1A2	1Y2	16	D13
CLDATA14	6	1A3	1Y3	14	D14
CLDATA15	8	1A4	1Y4	12	D15
CLDATA08	11	2A1	2Y1	9	D08
CLDATA09	13	2A2	2Y2	7	D09
CLDATA10	15	2A3	2Y3	5	D10
CLDATA11	17	2A4	2Y4	3	D11

CLDATA16	2	1A1	1Y1	18	D16
CLDATA17	4	1A2	1Y2	16	D17
CLDATA18	6	1A3	1Y3	14	D18
CLDATA19	8	1A4	1Y4	12	D19
CLDATA20	11	2A1	2Y1	9	D20
CLDATA21	13	2A2	2Y2	7	D21
CLDATA22	15	2A3	2Y3	5	D22
CLDATA23	17	2A4	2Y4	3	D23

CLDATA24	2	1A1	1Y1	18	D24
CLDATA25	4	1A2	1Y2	16	D25
CLDATA26	6	1A3	1Y3	14	D26
CLDATA27	8	1A4	1Y4	12	D27
CLDATA28	11	2A1	2Y1	9	D28
CLDATA29	13	2A2	2Y2	7	D29
CLDATA30	15	2A3	2Y3	5	D30
CLDATA31	17	2A4	2Y4	3	D31

FIFOWR- R22 FIFOWRL
33ΩFIFORD-
GSPRST-
D[00:31]AM7201
SONS

D00	7	D0	00	10	CLDATA00
D01	6	D1	01	11	CLDATA01
D02	5	D2	02	12	CLDATA02
D03	4	D3	03	13	CLDATA03
D04	3	D4	04	14	CLDATA04
D05	2	D5	05	15	CLDATA05
D06	1	D6	06	16	CLDATA06
D07	0	D7	07	17	CLDATA07

D08	7	D0	00	10	CLDATA08
D09	6	D1	01	11	CLDATA09
D10	5	D2	02	12	CLDATA10
D11	4	D3	03	13	CLDATA11
D12	3	D4	04	14	CLDATA12
D13	2	D5	05	15	CLDATA13
D14	1	D6	06	16	CLDATA14
D15	0	D7	07	17	CLDATA15

D08	7	D0	00	10	CLDATA08
D09	6	D1	01	11	CLDATA09
D10	5	D2	02	12	CLDATA10
D11	4	D3	03	13	CLDATA11
D12	3	D4	04	14	CLDATA12
D13	2	D5	05	15	CLDATA13
D14	1	D6	06	16	CLDATA14
D15	0	D7	07	17	CLDATA15

D08	7	D0	00	10	CLDATA08
D09	6	D1	01	11	CLDATA09
D10	5	D2	02	12	CLDATA10
D11	4	D3	03	13	CLDATA11
D12	3	D4	04	14	CLDATA12
D13	2	D5	05	15	CLDATA13
D14	1	D6	06	16	CLDATA14
D15	0	D7	07	17	CLDATA15

D08	7	D0	00	10	CLDATA08
D09	6	D1	01	11	CLDATA09
D10	5	D2	02	12	CLDATA10
D11	4	D3	03	13	CLDATA11
D12	3	D4	04	14	CLDATA12
D13	2	D5	05	15	CLDATA13
D14	1	D6	06	16	CLDATA14
D15	0	D7	07	17	CLDATA15

D16	7	D0	00	10	CLDATA16
D17	6	D1	01	11	CLDATA17
D18	5	D2	02	12	CLDATA18
D19	4	D3	03	13	CLDATA19
D20	3	D4	04	14	CLDATA20
D21	2	D5	05	15	CLDATA21
D22	1	D6	06	16	CLDATA22
D23	0	D7	07	17	CLDATA23

D16	7	D0	00	10	CLDATA16
D17	6	D1	01	11	CLDATA17
D18	5	D2	02	12	CLDATA18
D19	4	D3	03	13	CLDATA19
D20	3	D4	04	14	CLDATA20
D21	2	D5	05	15	CLDATA21
D22	1	D6	06	16	CLDATA22
D23	0	D7	07	17	CLDATA23

D16	7	D0	00	10	CLDATA16
D17	6	D1	01	11	CLDATA17
D18	5	D2	02	12	CLDATA18
D19	4	D3	03	13	CLDATA19
D20	3	D4	04	14	CLDATA20
D21	2	D5	05	15	CLDATA21
D22	1	D6	06	16	CLDATA22
D23	0	D7	07	17	CLDATA23

D24	7	D0	00	10	CLDATA24
D25	6	D1	01	11	CLDATA25
D26	5	D2	02	12	CLDATA26
D27	4	D3	03	13	CLDATA27
D28	3	D4	04	14	CLDATA28
D29	2	D5	05	15	CLDATA29
D30	1	D6	06	16	CLDATA30
D31	0	D7	07	17	CLDATA31

D24	7	D0	00	10	CLDATA24
D25	6	D1	01	11	CLDATA25
D26	5	D2	02	12	CLDATA26
D27	4	D3	03	13	CLDATA27
D28	3	D4	04	14	CLDATA28
D29	2	D5	05	15	CLDATA29
D30	1	D6	06	16	CLDATA30
D31	0	D7	07	17	CLDATA31

COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION

MICROPROSE Games

180 LAKEFRONT DR. HUNT VALLEY, MD 21030

DRAFTER

DAVID J. BELLAM

CHECKER

ENGINEER

DOUGLAS FROME

DATE 1/14/91

APPROVAL

DATE 1/14/91

DATE

DATE

DATE

DATE

DATE

DATE

MICROPROSE GAMES

180 LAKEFRONT DR. HUNT VALLEY, MD 21030

TITLE

VVGB

DR MATH TO CLIPPER FIFO MEMORY

SIZE

C

DRAWING NUMBER

DW-00011C-0013-03

REV

RELEASE

DATE 1-2-1991-9-51

SHEET 27 OF 27

1

1

2

5

5

A

8

MICROPROSE GAMES, 180 Lakefront Drive, Hunt Valley, Maryland 21030

PROJECT: Video Graphics PCB DRWG NO: PL-00011A-0013-003 REV:B

DATE: Wed 19-Dec-1990

ITEM	QTY	VENDOR	PART NUMBER	PART DESC	VALUE	MPG P/N
REF. DES.						
1	*	4	AM7201-50JC U136,U137,U138,U139	512x9FIFO	50NS	222-00004-450
2		1	71922-010 J1	2X5HEADER	.100"	610-00800-010
3		3	11C1210X7R104K050NT C18,C19,C26	SMTCERCAP	0.1UF	401-02002-104
4		1	LM385BZ-1.2 D1	ZENER	1.2V	301-00001-012
5		1	11C1210X7R103K050NT C34	SMTCERCAP	0.01UF	401-02002-103
6		1	293D336X9016D2T C33	SMTTANTCAP	33UF	420-00163-336
7		1	BT101KC30 U5	VIDEODAC	30MHZ	245-00001-230
8		2	2743019446 L2,L1	FERRITEBD	75 OHM	595-00001-100
9		1	293D106X9016C2T C32	SMTTANTCAP	10UF	420-00162-106
10		1	CCF-50 15R0F R7	1%MFRES	15 OHM	503-00001-150
11		1	CCF-50 5490F R8	1%MFRES	549 OHM	503-00001-551
12		3	CCF-50 75R0F R6,R5,R4	1%MFRES	75 OHM	503-00001-750
13		4	CCF-50 1002F R9,R3,R2,R1	1%MFRES	10KOHM	503-00001-103
14		2	SN74ALS541N U7,U21	OCTDRVRS		200-00541-200
15		3	MC74F157AN U11,U26,U32	QUAD2:1MUX		203-00157-200
16		1	GAL16V8-15LP U65	VFBMISCA	15 NS	120-00002-010
17		2	SN74AS374N U6,U31	OCTREGISTER		201-00374-200

ITEM	QTY	VENDOR PART NUMBER	PART DESC	VALUE	MPG P/N
		REF. DES.			
18	2	SN74AS574N U3,U16	OCTREGISTER		201-00574-200
19	* 4	VT20C69-35PC U10,U15,U20,U25	4Kx4SRAM	35NS	221-00002-235
20					
21	1	AmPAL16L8-7CN U56	VFBWRITC	7.5 NS	120-00002-211
22	1	SN74AS32N U36	HEX2-IN'OR'		201-00032-200
23	9	SN74AS244DW U47,U59,U68,U75,U83,U141,U143,U144,U142	SMT OCTBUFFERS		201-00244-100
24	1	GAL16V8-15LP U45	VRAMCLKA	15NS	120-00002-001
25	1	GAL22V10-15LP U93	VFBCONTA	15NS	120-00002-002
26	1	GAL22V10-15LP U87	VFBSWCHA	15NS	120-00002-003
27	9	SN74AS253DW U46,U57,U58,U67,U66,U73,U74,U81,U82	SMTDUAL4:1MUX		201-00253-100
28	1	GAL22V10-25LP U72	CNT9BITA	25NS	120-00002-004
29	* 1	MPGDRAW2 U105	DRAW2ASIC	40MHZ	100-TB001-340
30	1	SN74AS1034AN U89	HEXDRIVER		201-01034-200
31	* 3	IDT7130SA-35J U94,U106,U113	1Kx8DPSRAM	35NS	222-00002-435
32	1	GAL16V8-15LP U79	D1D2HSA	15NS	120-00002-005
33	1	GAL16V8-25LP U140	MCLIPSMA	25NS	120-00002-006
34	* 1	MPGDRAW1 U107	DRAW1ASIC	20MHZ	100-PK001-320
35	* 6	MPGCLIPPER U118,U119,U120,U127,U128,U129	CLIPPERASIC	20MHZ	100-MW001-320

ITEM	QTY	VENDOR PART NUMBER	PART DESC	VALUE	MPG P/N
		REF. DES.			
36	* 20	HM534251ZP-12	256Kx4VRAM	120NS	222-00006-612
		U4,U8,U9,U12,U13,U14,U17,U18,U19,U22,U23,U25,U27, U28,U29,U30,U33,U34,U35,U41			
37	1	SN74ALS2541N	OCTDRVWR/SERRES		200-02541-200
		U39			
38	* 4	TMS44C256-12N	256Kx4DRAM	120NS	220-00002-212
		U37,U43,U50,U54			
39	1	AM29C863PC	9BITXCVR		235-00005-200
		U71			
40	2	SN74ALS244ADW	SMT OCTBUFFERS		200-00244-100
		U1,U62			
41	1	AM29C823ASC	SMT9BITLATCH		235-00004-100
		U78			
42	1	GAL16V8-15LP	VRAM_SGA	15NS	120-00002-007
		U40			
43	4	SN74ALS273N	OCTREGISTERS		200-00273-200
		U44,U51,U55,U64			
44	1	GAL22V10-15LP	GADRDC1A	15NS	120-00002-008
		U77			
45	1	AM29841APC	10BITLATCHES		235-00008-100
		U63			
46	1	GAL22V10-25LP	GADRDC0A	25NS	120-00002-009
		U86			
47					
48	1	LT1081-CN	RS232DRVR		235-00001-200
		U60			
49	1	22-05-7048	MOLEX4PIN	.100"	610-00601-004
		J3			
50	4	293D105X0016A2T	SMTTANTCAP	1UF	420-00060-105
		C68,C69,C70,C71			
51					
52	* 1	SCN2651CC1N28	UART		240-00002-200
		U69			
53	6	SN74ALS245ADW	SMT OCTXCVR		200-00245-100
		U98,U99,U102,U103,U109,U110			

ITEM	QTY	VENDOR PART NUMBER	PART DESC	VALUE	MPG P/N
		REF. DES.			
54 D*	1	TMS34010FNL-40 U115	68PLCCGSP	40MHZ	135-34010-440
55	1	SN74ALS74N U53	DUAL DFLOPS		200-00074-200
56	1	SN74ALS08N U70	HEX2-IN'AND'		200-00008-200
57	3	SN74ALS373N U76,U85,U91	OCTLATCHES		200-00373-200
58	1	68001-502 J8, [J6,J10]	2PINJUMPER	.100"	610-00002-002
59	0	68001-503 [J2,J4,J5,J7,J9]	3PINJUMPER	.100"	610-00002-003
60	1	SN74AS04N U80	HEXINVERTER		201-00004-200
61	1	SN74LS393N U123	DUAL4BITBICNTR		202-00393-200
62	1	SN74AS74N U116	DUALDFLOPS		201-00074-200
63	6	CCF-07 100G R14,R15,R17,R18,R19,R21	2%MFRESISTOR	10 OHM	503-00002-100
64	1	X0-43D-40 U104	OSCILLATOR	40MHZ	290-00001-040
65	1	1N746A D2	ZENER	3.3V	301-00002-033
66	1	KSA1A211 SW1	PBSWITCH		625-00002-001
67	1	CCF-07 102G R10	2%MFRESISTOR	1KOHM	503-00002-102
68	1	CCF-07 820G R12	2%MFRESISTOR	82 OHM	503-00002-820
69	4	CCF-07 103G R11,R13,R16,R20	2%MFRESISTOR	10KOHM	503-00002-103
70	1	1N914 D3	DIODE		300-00002-003
71	1	LM311N U90	VOLTCOMP		280-00002-200

ITEM	QTY	VENDOR PART NUMBER	PART DESC	VALUE	MPG P/N
		REF. DES.			
72	1	173D335X0020V C100	AXTANTCAP	3.3UF	422-00062-335
73	3	SN74LS14N U84,U132,U135	HEXSTINVERT		202-00014-200
74	3	SN74ALS04BN U2,U42,U49	HEXINVERTERS		200-00004-200
75	1	SN74ALS157N U125	QUAD2:1MUX		200-00157-200
76	0	XO-43D-50 U92	OSCILLATOR	50MHZ	290-00001-050
77	0	XO-43B-20 U131	OSCILLATOR	20MHZ	290-00001-020
78	4	SN74AS1004AN U100,U111,U117,U126	HEXINVDRVRS		201-01004-200
79	14	7-0805G-5 TP2,TP1,TP5,TP4,TP15,TP14,TP13,TP12,TP11,TP10,TP9, TP8,TP7,TP6	TESTPIN		710-00001-001
80	5	836C103X2PE U38,U61,U112,U122,U145	SMT PULRESPAK	10KOHM	502-00001-103
81	1	ICTE-5 D14	ZENER	5.0V	300-00001-002
82	1 0	26-60-5100 09-52-3102 P2	MOLEX10PIN	.156"	610-00601-010 610-10600-010
83	8	TAJ C156M010CR C3,C10,C58,C107,C123,C134,C154,C157	SMT TANTCAP	15UF	420-00002-156
84	88	11C1206Z5U104M050NT C1,C2,C4,C5,C7,C9,C13,C21,C28,C36,C41,C42,C45,C47,C48,C50,C52, C53,C54,C55,C56,C59,C60,C61,C63,C64,C65,C66,C67,C72,C73,C74, C75,C76,C77,C78,C79,C80,C81,C82,C83,C84,C85,C86,C87,C88,C89, C90,C91,C92,C93,C95,C96,C97,C98,C99,C101,C102,C103,C104,C106, C109,C110,C111,C113,C114,C115,C118,C119,C120,C124,C132,C133, C136,C137,C139,C140,C141,C143,C148,C153,C155,C156,C158,C159, C160,C161	SMT CERCAP	0.1UF	401-01000-104
85	10	HLMP3600 D4,D5,D6,D7,D8,D9,D10,D11,D12,D13	LED	RED	305-00003-002
86	1	71922-140 P3	2X20RA CONNECTR	.100"	610-00900-040

ITEM	QTY	VENDOR PART NUMBER	PART DESC	VALUE	MPG P/N
		REF. DES.			
87	53	11C1206Z5U334M050NT	SMT CER CAP	0.33UF	401-02000-334
		C6, C11, C12, C14, C15, C16, C17, C20, C22, C23, C24, C25, C27, C29, C30, C31, C35, C37, C38, C39, C40, C43, C44, C46, C49, C51, C57, C62, C94, C105, C108, C112, C116, C117, C121, C125, C126, C127, C128, C129, C130, C131, C135, C138, C142, C144, C145, C146, C147, C149, C150, C151, C152			
88 A*	1	AM27C010-155DC	128Kx8EPROM	150NS	110-00002-101
		U101	VGBK0BY0.001		
89 A*	1	AM27C010-155DC	128Kx8EPROM	150NS	110-00002-102
		U108	VGBK0BY1.001		
90 A*	1	AM27C010-155DC	128Kx8EPROM	150NS	110-00002-103
		U114	VGBK1BY0.001		
91 A*	1	AM27C010-155DC	128Kx8EPROM	150NS	110-00002-104
		U97	VGBK1BY1.001		
92 A*	1	AM27C010-305DC	128Kx8EPROM	300NS	110-00002-105
		U124	VGBK2BY0.001		
93 A*	1	AM27C010-305DC	128Kx8EPROM	300NS	110-00002-106
		U121	VGBK2BY1.001		
94 A*	1	AM27C010-305DC	128Kx8EPROM	300NS	110-00002-107
		U130	VGBK3BY0.001		
95 A*	1	AM27C010-305DC	128Kx8EPROM	300NS	110-00002-108
		U133	VGBK3BY1.001		
96 A	0	2-644018-2	32PIN SOCKET	.600"	600-00003-632
		[UX97, UX101, UX108, UX114, UX121, UX124, UX130, UX133]			
97 B	0	ICO-324MTT	24PIN SOCKET	.300"	600-00001-324
		[UX72, UX77, UX86, UX87, UX93]			
98 C	5	ICO-320MTT	20PIN SOCKET	.300"	600-00001-320
		UX40, UX45, UX65, UX79, UX140			
99 D	1	PLCC-68-P-T	68PLCC SOCKET		602-00001-068
		UX115			
100	1	68686-102	SHUNT		715-00001-001
		FOR J8			
101	0	SRS8-12-01	SPACER	.750"	700-00001-031

ITEM	QTY	VENDOR PART NUMBER	PART DESC	VALUE	MPG P/N
REF. DES.					
102	1	ZS5-120-02-L-D-615 P1	2x20CONNECTOR	.100"	610-00004-040
103	1	CCF-07 330G R22	2%MFRESISTOR	33 OHM	503-00002-330
104	** 0	AmPAL16L8-7CN U49	MUX2D3DA	7.5NS	120-00002-012

398					

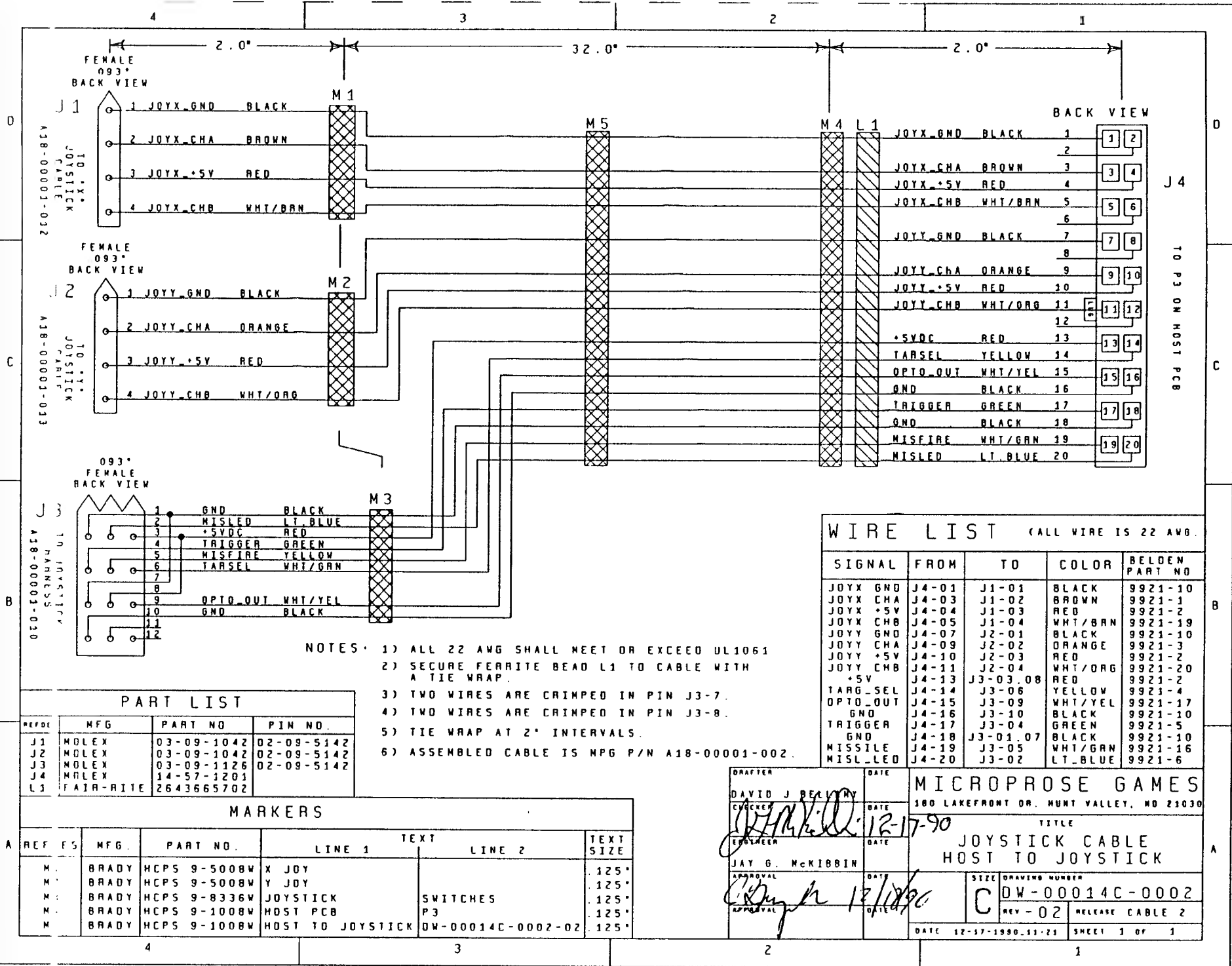
NOTES:

1. PARTS REQUIRING 0.33UF DECOUPLING CAPACITORS ARE DESIGNATED WITH AN ASTERISK (*) BETWEEN THE ITEM AND QTY COLUMNS.
2. PARTS REQUIRING SOCKETS ARE MARKED WITH A LETTER CORRESPONDING TO THE SOCKETS (SOCKETS ARE ITEMS 96 - 99).
3. ALL PARTS WITH A DOUBL ASTERISK (**) NEXT TO ITEM NUMBER ARE NOT POPULATED FOR THE CURRENT BUILD.

Dec 19. 1990

F15 CABLE AND HARNESS LIST

Drawing No.	Assembly No.	Name
DW-00014C-0002	A18-00001-002	JOYSTICK CABLE
DW-00014C-0003	A18-00001-003	PANEL CONTROL HARNESS
DW-00014C-0004	A18-00001-004	COIN DOOR
DW-00014C-0005	A18-00001-005	THROTTLE/PANEL
DW-00014C-0006	A18-00001-006	RS-232 CABLE
DW-00014C-0007	A18-00001-007	HOST TO VGB
DW-00014C-0008	A18-00001-008	LEFT SPEAKER CABLE
DW-00014C-0009	A18-00001-009	THROTTLE HARNESS
DW-00014C-0010	A18-00001-010	JOYSTICK HARNESS
DW-00014C-0011	A18-00001-011	RIGHT SPEAKER CABLE
DW-00014C-0012	A18-00002-001	DC POWER HARNESS
DW-00014C-0013		NOT USED
DW-00014C-0014	A18-00003-002	INPUT A.C. HARNESS
DW-00014C-0015	A18-00003-003	A.C. TRAY TO CABINET TOP
DW-00014C-0016	A18-00003-004	100 VOLT TRANSFORMER CABLE
DW-00014C-0017	A18-00003-005	120 VOLT TRANSFORMER CABLE
DW-00014C-0018	A18-00003-006	240 VOLT TRANSFORMER CABLE
DW-00014C-0019	A18-00003-007	TRANSFORMER ASSEMBLY
DW-00014C-0020	A18-00003-008	BILL ACCEPTOR CABLE
DW-00014C-0021		NOT USED
DW-00014C-0022		NOT USED
DW-00014C-0023	A18-00001-013	X JOYSTICK
DW-00014C-0024	A18-00001-012	Y JOYSTICK
DW-00014C-0025	A18-00003-010	DISPLAY CABLE
DW-00014C-0026	A18-00003-013	LOWER SHROUD HARNESS
DW-00014C-0027	A18-00002-002	D.C. FAN EXTENSION CABLE
DW-00014C-0028	A18-00003-014	MARQUEE A.C. LIGHT CONNECTOR
DW-00014C-0029	A18-00003-015	FLORESCENT LIGHT 'Y' CABLE
DW-00014C-0030	A18-00003-016	UPPER SHROUD HARNESS



WIRE LIST (ALL WIRE IS 22 AWG)				
SIGNAL	FROM	TO	COLOR	BELOEN PART NO
JOYX GND	J4-01	J1-01	BLACK	9921-10
JOYX CHA	J4-03	J1-02	BROWN	9921-1
JOYX +5V	J4-04	J1-03	RED	9921-2
JOYX CHB	J4-05	J1-04	WHT/BRN	9921-19
JOYY GND	J4-07	J2-01	BLACK	9921-10
JOYY CHA	J4-09	J2-02	ORANGE	9921-3
JOYY +5V	J4-10	J2-03	RED	9921-2
JOYY CHB	J4-11	J2-04	WHT/ORG	9921-20
+5V	J4-13	J3-03.08	RED	9921-2
TARG_SEL	J4-14	J3-06	YELLOW	9921-4
OPTO_OUT	J4-15	J3-09	WHT/YEL	9921-17
GND	J4-16	J3-10	BLACK	9921-10
TRIGGER	J4-17	J3-04	GREEN	9921-5
GND	J4-18	J3-01.07	BLACK	9921-10
MISSILE	J4-19	J3-05	WHT/GRN	9921-16
MISLED	J4-20	J3-02	LT. BLUE	9921-6

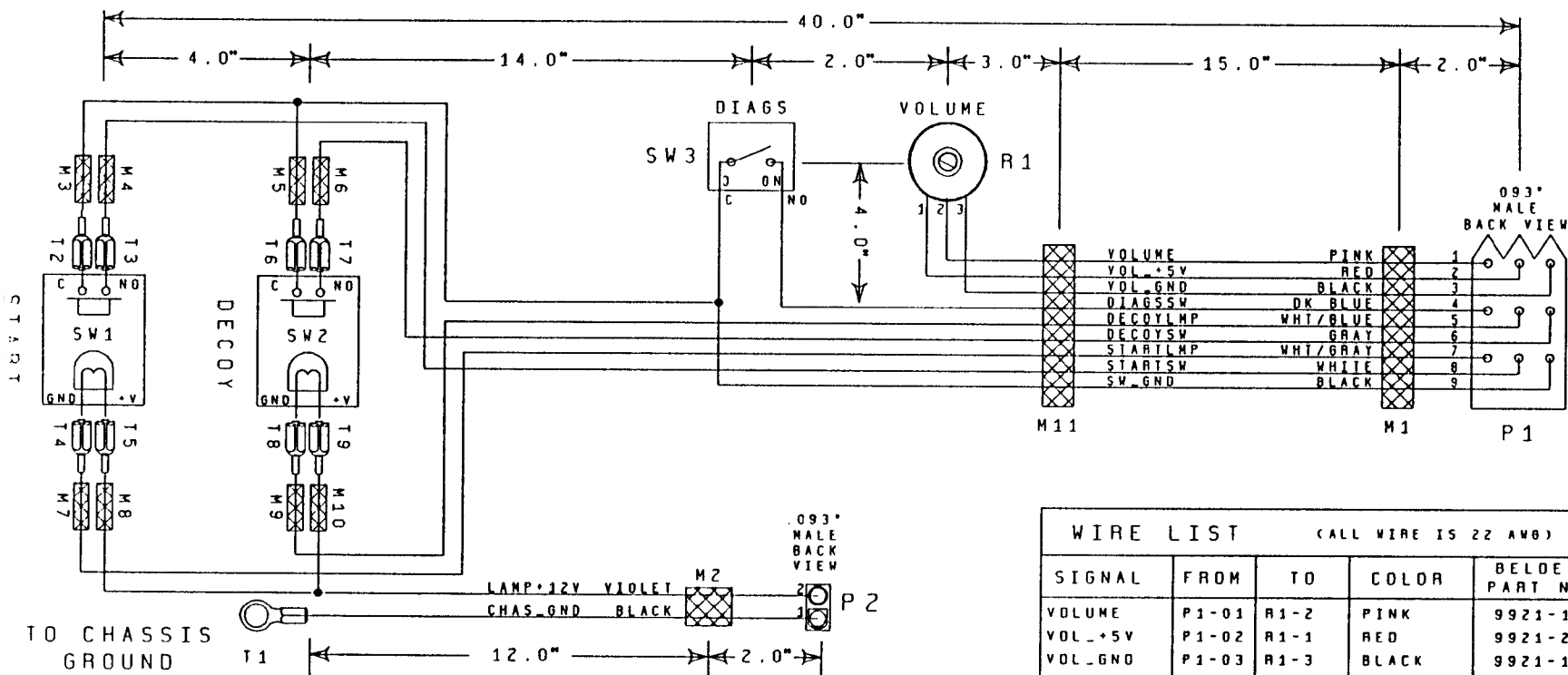
PART LIST			
REF	MFG	PART NO	PIN NO.
J1	MOLEX	03-09-1042	02-09-5142
J2	MOLEX	03-09-1042	02-09-5142
J3	MOLEX	03-09-1126	02-09-5142
J4	MOLEX	14-57-1201	
L1	FAIR-RITE	2643665702	

MARKERS					
REF	ES	MFG.	PART NO.	TEXT	TEXT SIZE
M		BRADY	HCPS 9-5008W	X JOY	125"
M		BRADY	HCPS 9-5008W	Y JOY	125"
M		BRADY	HCPS 9-8336W	JOYSTICK	125"
M		BRADY	HCPS 9-1008W	HOST PCB	125"
M		BRADY	HCPS 9-1008W	HOST TO JOYSTICK	125"

DRAFTER
DAVID J. BEALMY
CHECKED
DATE 12-17-90
APPROVAL
JAY G. McKIBBIN
DATE 12/18/90

DATE 12-17-1990

MICROPROSE GAMES
180 LAKEFRONT DR. HUNT VALLEY, MD 21030
TITLE
JOYSTICK CABLE
HOST TO JOYSTICK
SIZE
DW-00014C-0002
REV - 02
RELEASE CABLE 2
DATE 12-17-1990
SHEET 1 OF 1



WIRE LIST (ALL WIRE IS 22 AWG)				
SIGNAL	FROM	TO	COLOR	BELDEN PART NO
VOLUME	P1-01	R1-2	PINK	9921-12
VOL_+5V	P1-02	R1-1	RED	9921-2
VOL_GND	P1-03	R1-3	BLACK	9921-10
DIAGSSW	P1-04	SW3-NO	DK BLUE	9921-13
DECOYLAMP	P1-05	SW2-4	WHT/BLUE	9921-18
DECOYSW	P1-06	SW2-2	GRAY	9921-8
STARTLAMP	P1-07	T4	WHT/GRAY	9921-21
STARTSW	P1-08	T3	WHITE	9921-9
SW_GND	P1-09	SW3-C	BLACK	9921-10
		SW3-C	BLACK	9921-10
		T6	BLACK	9921-10
LAMP+12V	T5	T9	VIOLET	9921-7
	T9	P2-2	VIOLET	9921-7
CHAS_GND	P2-1	T1	BLACK	9921-10

NOTES

- ALL 22 AWG WIRE SHALL MEET OR EXCEED UL1061.
- SW1 & SW2 ARE SHOWN FOR REFERENCE ONLY.
- PLACE MARKERS M3 - M10 1" FROM PUSH-ON TERMINALS (T2 - T9).
- TIE WRAP AT 4" INTERVALS.
- MARKER M11 HAS TWO LINES OF TEXT.
- BREAKOUT DISTANCE FOR SW3 & R1 ARE THE SAME.
- ASSEMBLED HARNESS IS MPG P/N A18-00001-003.

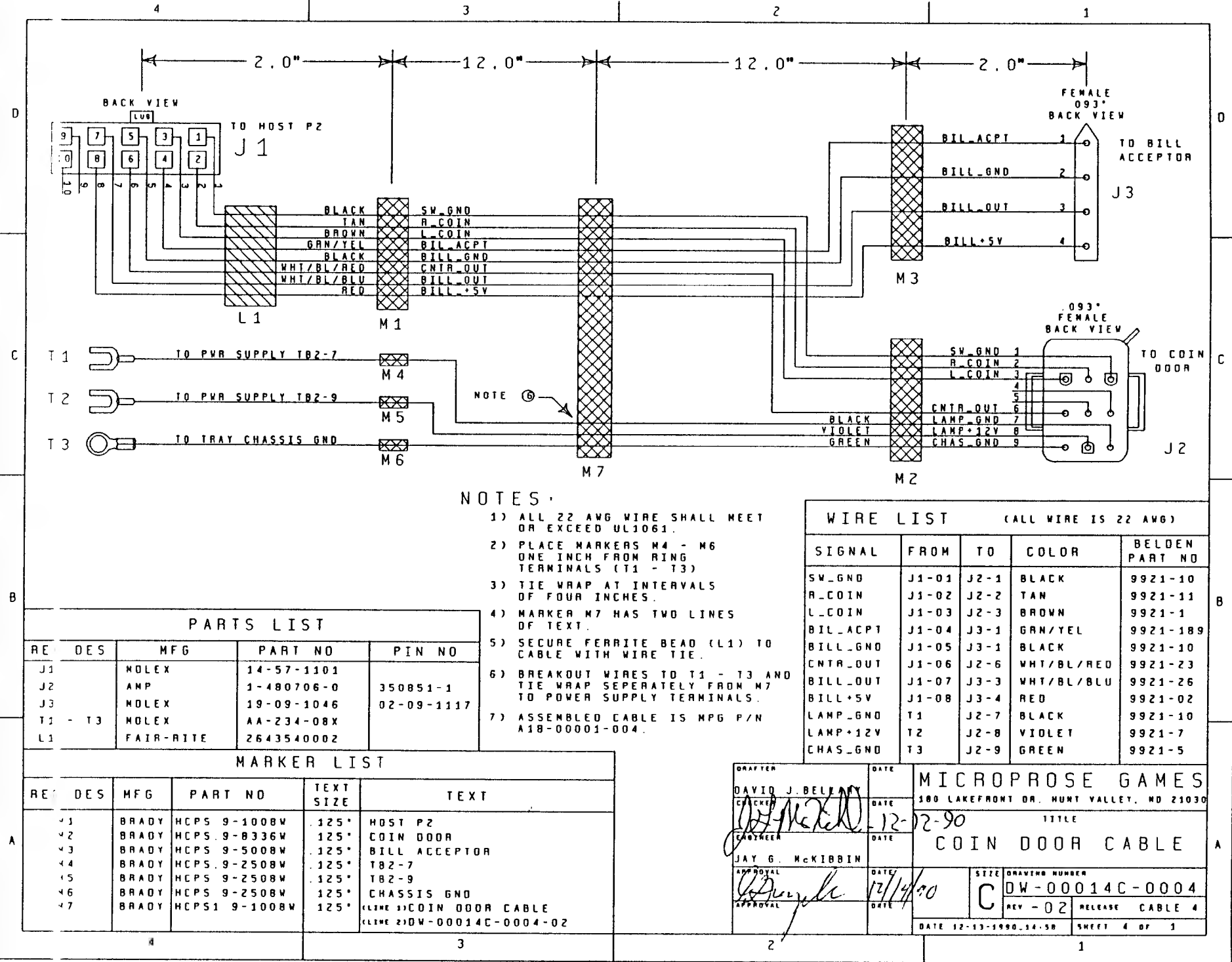
PARTS LIST

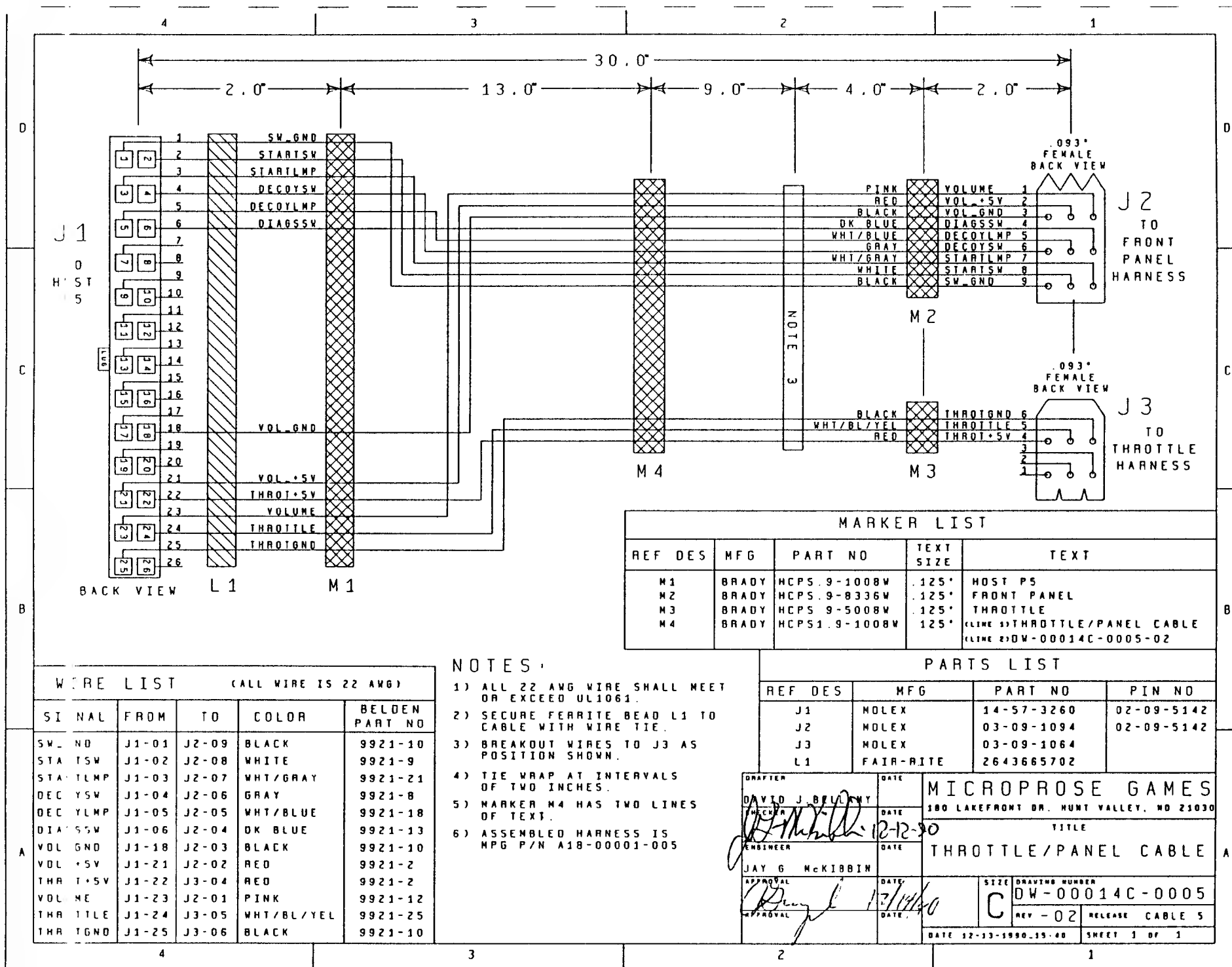
RE	DES	MFG	PART NO	PIN NO
P1		MOLEX	03-09-2092	02-09-6123
P2		MOLEX	19-09-2026	02-09-2118
T2 - T9		AMP	2-520184-4	
T1		AMP	2-520571-2	
R1		CLAROSTAT	RV4NAYS0502A	
SW1		SWITCHCRAFT	46202LR	

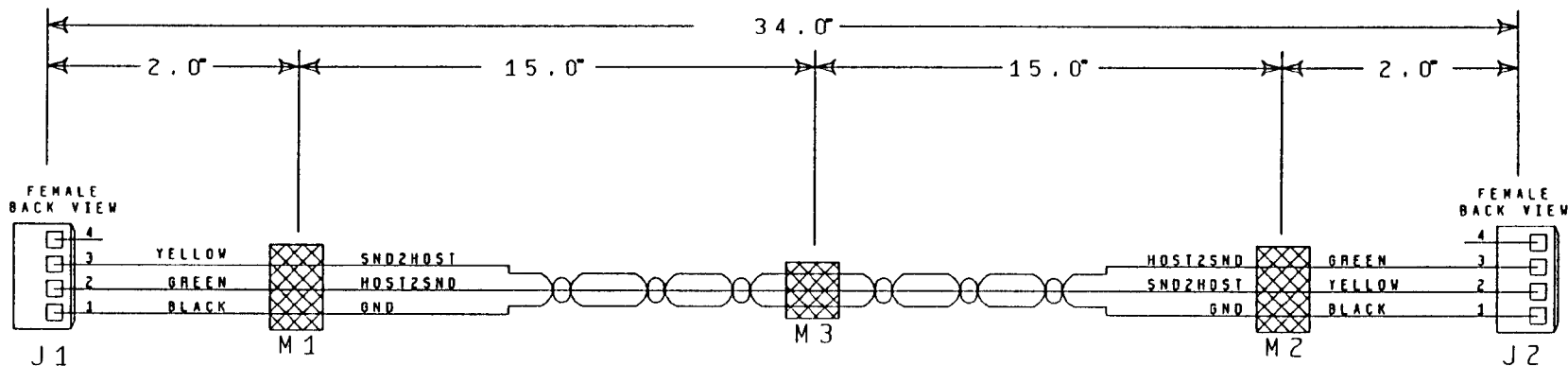
MARKER LIST

RE	DES	MFG	PART NO	TEXT SIZE	TEXT
M1		BRADY	HCPS 9-8336W	.125"	PANEL CONTROLS
M2		BRADY	HCPS 9-2508W	.125"	PWR SUPPLY
M3	M5	BRADY	HCPS 9-2508W	.125"	C
M4	M6	BRADY	HCPS 9-2508W	.125"	NO
M8	M10	BRADY	HCPS 9-2508W	.125"	12V
M7	M9	BRADY	HCPS 9-2508W	.125"	GND
M11		BRADY	HCPS 9-8336W	.125"	(LINE 1) PANEL CONTROL HARNESS
					(LINE 2) DW-00014C-0003-02

DRAFTER DAVID J. BERRY		DATE 12-12-90		MICROPROSE GAMES	
CHECKER JAY G. McKIBBIN		DATE 12/14/90		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
APPROVAL JAY G. McKIBBIN		DATE 12/14/90		TITLE PANEL CONTROL HARNESS	
APPROVAL		DATE		SIZE C	
				DRAWING NUMBER DW-00014C-0003	
				REV - 02	
				RELEASE CABLE 3	
				DATE 12-13-1990 10:44	
				SHEET 3 OF 3	







WIRE LIST (ALL WIRE IS 22 AWG)				
SIGNAL	FROM	TO	COLOR	BELDEN PART NO
GND	J1-01	J2-01	BLACK	9921-10
HOST2SND	J1-02	J2-03	GREEN	9921-5
SND2HOST	J1-03	J2-02	YELLOW	9921-4

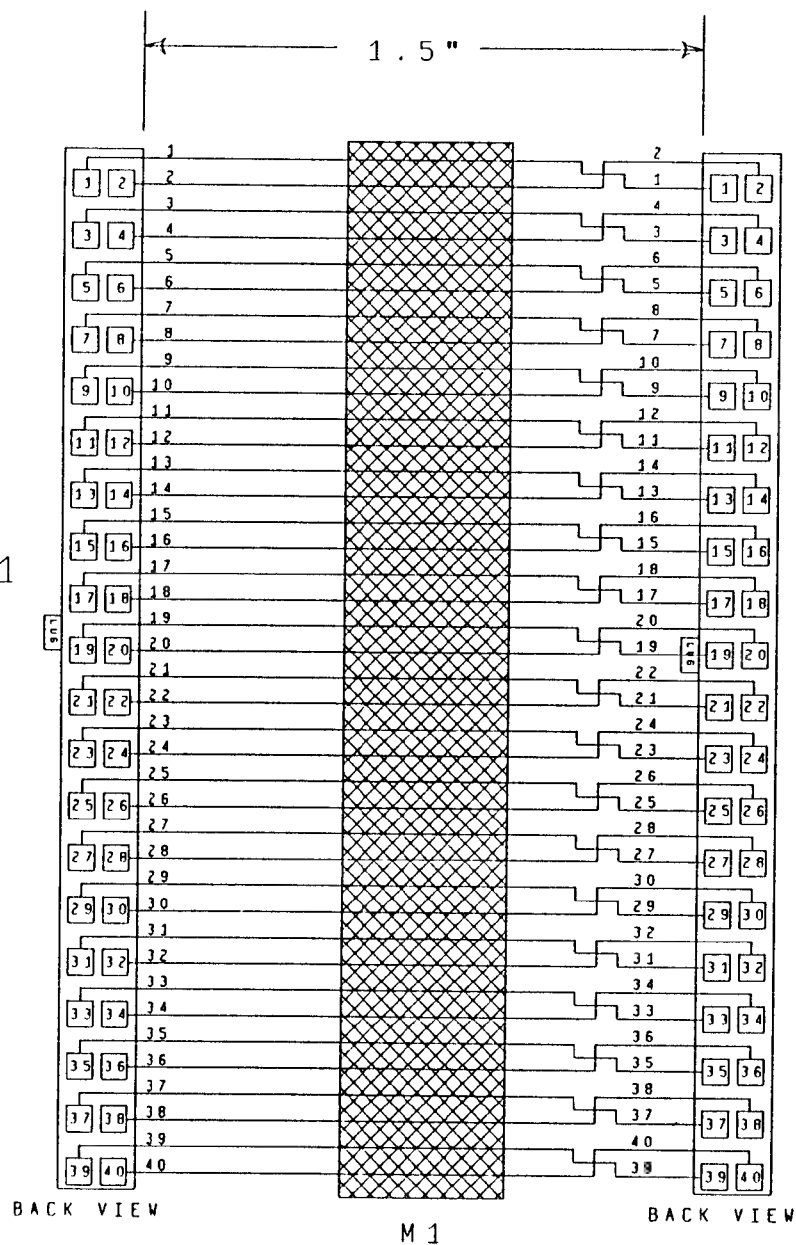
NOTES:

- 1) ALL 22 AWG WIRE SHALL MEET OR EXCEED UL1061.
- 2) TIE WRAP AT INTERVALS OF TWO INCHES.
- 3) MARKER M3 HAS TWO LINES OF TEXT.
- 4) WIRES ARE TWISTED BETWEEN MARKERS M1 AND M2
- 5) ASSEMBLED CABLE IS MPG P/N A18-00001-006

PARTS LIST			
REF DES	MFG	PART NO	PIN NO
J1	MOLEX	22-01-2041	08-50-0114
J2	MOLEX	22-01-2041	08-50-0114

MARKER LIST				
REF DES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS 9-5008W	.125"	HOST J1
M2	BRADY	HCPS 9-5008W	.125"	SND BRD J1
M3	BRADY	HCPS 1.9-5008W	.125"	(LINE 1) RS-232 CABLE #1 (LINE 2) DW-00014C-0006-02

DRAFTER DAVID J. BERNARDY		DATE 12-10-80		MICROPROSE GAMES	
CHECKER [Signature]		DATE 12-10-80		180 LAKEFRONT DR. MOUNT VALLEY, MD 21030	
ENGINEER [Signature]		DATE 12-10-80		TITLE RS-232 CABLE #1	
JAY G. McKIBBIN		DATE 12/14/80		SIZE C	
APPROVAL [Signature]		DATE 12/14/80		DRAWING NUMBER DW-00014C-0006	
APPROVAL [Signature]		DATE 12-11-1990 10:36		REV - 02 RELEASE CABLE 6	
				SHEET 1 OF 1	



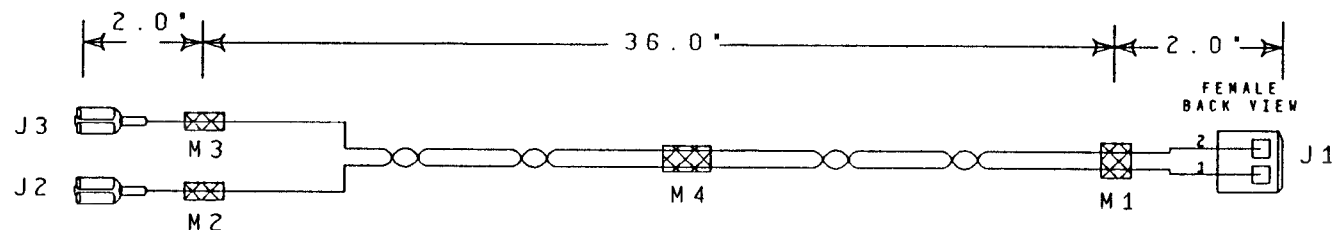
MARKER LIST				
REF DES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	DAT-9-292	125"	(LINE 1) HOST TO VGB (LINE 2) DW-00014C-0007-02

PARTS LIST			
REF DES	MFG	PART NO	PIN NO
J1	DUPONT	71602-040	
J2	DUPONT	71602-040	
CABLE	3-M	3365/40	

NOTES:

- 1) ALL 28 AWG RIBBON CABLE SHALL MEET OR EXCEED UL2651
- 2) MARKER M1 HAS TWO LINES OF TEXT
- 3) DISTANCE SPECIFIED BETWEEN J1 AND J2 IS MEASURED BETWEEN THE INSIDE EDGES OF J1 AND J2 AFTER ASSEMBLY
- 4) ASSEMBLED CABLE IS MPG P/N A18-00001-007

DRAFTER DAVID J BELLAMY		DATE 12-10-90		MICROPROSE GAMES	
CHECKER JAY G McKIBBIN		DATE 2/13/91		180 LAKEFRONT DR HUNT VALLEY, MD 21030	
APPROVAL [Signature]		DATE 2/13/91		TITLE HOST TO VGB RIBBON CABLE	
REVISION [Signature]		DATE 2/13/91		SIZE C	
				DRAWING NUMBER DW-00014C-0007	
				REV - 02 RELEASE CABLE 7	
				DATE 11-27-1990-17-28 SHEET 7 OF 1	



WIRE LIST (ALL WIRE IS 22 AWG)				
SIGNAL	FROM	TO	COLOR	BELDEN PART NO
L AUDIO	J1-01	J2	WHT/RED	9921-15
GND	J1-02	J3	BLACK	9921-10

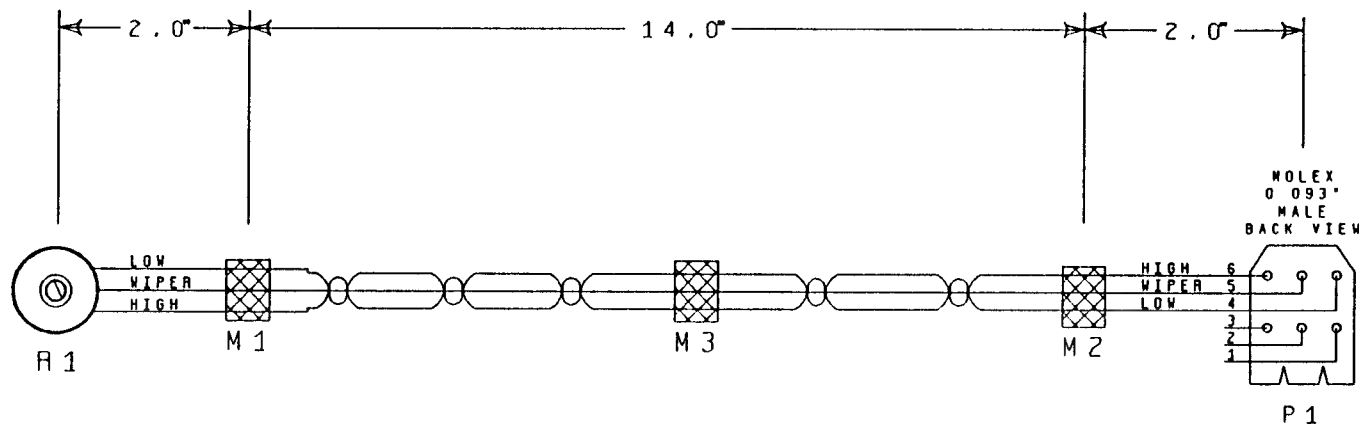
PARTS LIST			
REF DES	MFG	PART NO	PIN NO
J1	MOLEX	22-01-2021	08-50-0114
J2, J3	AMP	2-520181-4	

MARKER LIST				
REF DES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS 9-3758W	.125"	SOUND BD J5
M2	BRADY	HCPS 9-2508W	.125"	L SPKR +
M3	BRADY	HCPS 9-2508W	.125"	L SPKR -
M4	BRADY	HCPS1 9-3758W	.125"	(LINE 1) LEFT SPEAKER CABLE (LINE 2) DW-00014C-0008-02

NOTES:

- 1) ALL 22 AWG WIRE SHALL MEET OR EXCEED UL1061.
- 2) TIE WRAP AT INTERVALS OF TWO INCHES.
- 3) MARKER M4 HAS TWO LINES OF TEXT
- 4) TWIST WIRE PAIR AND TIE WRAP AT 4" INTERVALS.
- 5) ASSEMBLED CABLE IS MPG P/N A18-00001-0008

DRAFTER DAVID J. BELLAMY		DATE 12-10-90		MICROPROSE GAMES	
CHECKED <i>[Signature]</i>		DATE 12-10-90		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER JAY G. McKIBBIN		DATE 12-13-90		TITLE LEFT SPEAKER CABLE	
APPROVAL <i>[Signature]</i>		DATE 12-13-90		SIZE C	
APPROVAL		DATE		DRAWING NUMBER DW-00014C-0008	
				REV - 02 RELEASE CABLE 8	
				DATE 12-11-1990.10-07 SHEET 1 OF 1	



WIRE LIST (ALL WIRE IS 22 AWG)				
SIGNAL	FROM	TO	COLOR	BELDEN PART NO
LOW	R1-01	P1-04	BLACK	9921-10
WIPER	R1-02	P1-05	WHITE	9921-9
HIGH	R1-03	P1-06	RED	9921-2

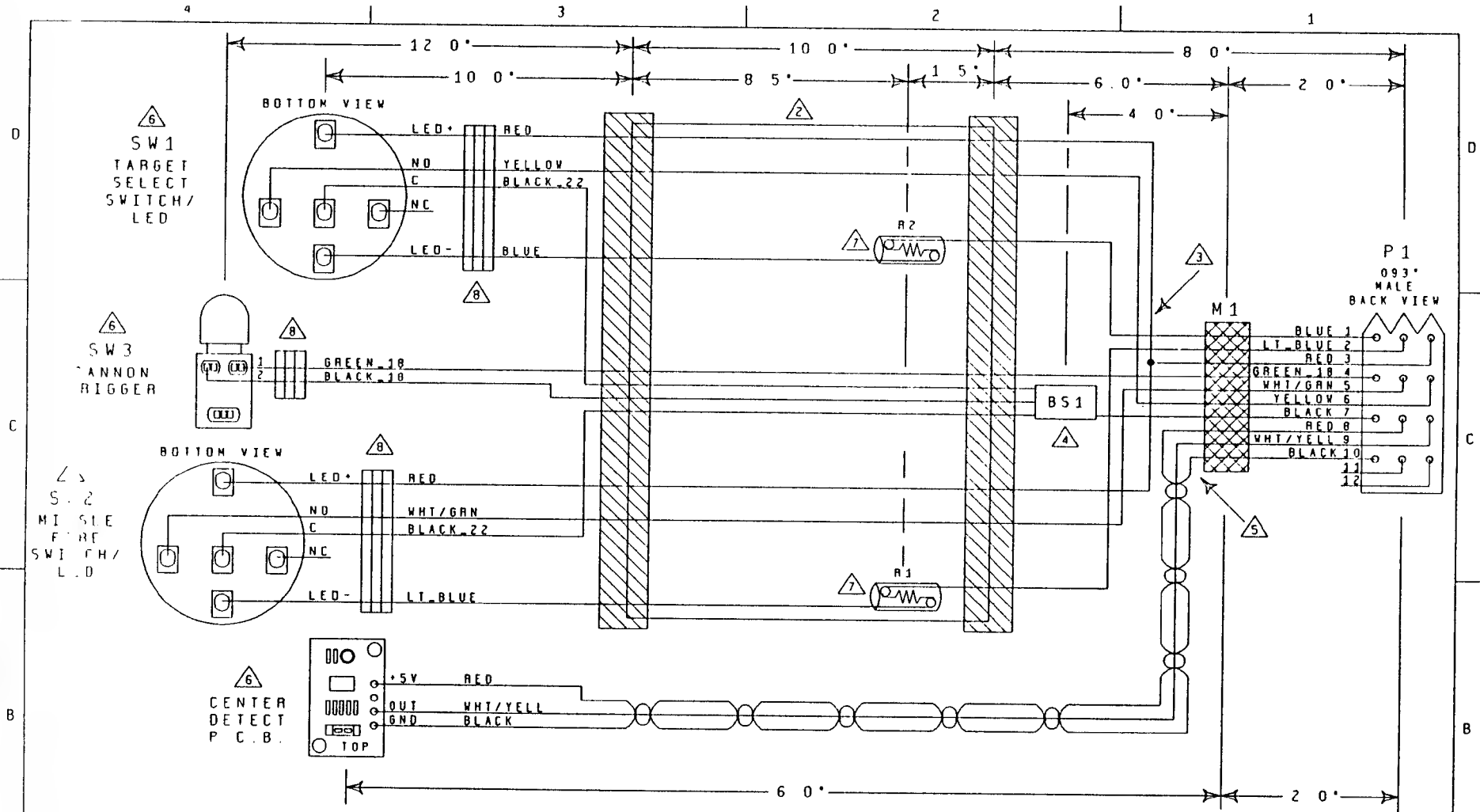
PARTS LIST			
REFDES	MFG	PART NO	PIN NO
P1	MOLEX	03-09-2064	02-09-2116
R1	CLAROSTAT	RV4NAYS0502A	

MARKER LIST				
REFDES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS 9-5008W	.125"	THROTTLE
M2	BRADY	HCPS 9-5008W	.125"	THROTTLE 2 HOST
M3	BRADY	HCPS1.9-3758W	.125"	(LINE 1) THROTTLE HARNESS (LINE 2) DW-00014C-0009-02

NOTES:

- 1) ALL 22 AWG WIRE SHALL MEET OR EXCEED UL1061.
- 2) TIE WRAP AT INTERVALS OF TWO INCHES.
- 3) MARKER M3 HAS TWO LINES OF TEXT.
- 4) WIRES ARE TWISTED BETWEEN MARKERS M1 AND M2.
- 5) ASSEMBLED HARNESS IS MP6 P/N A18-00001-009.

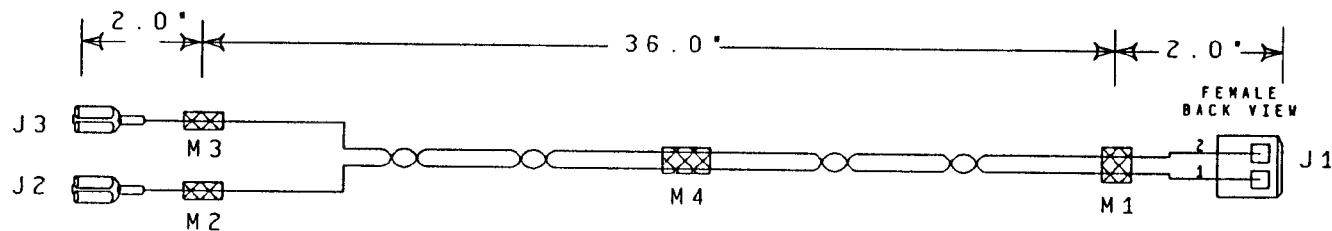
DRAFTER DAVID J. BELMONT CHECKED 12-12-80		DATE 12-12-80		MICROPROSE GAMES 180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER JAY G. MCKIBBIN		DATE 12/13/80		TITLE THROTTLE HARNESS	
APPROVAL [Signature]		DATE 12/13/80		SIZE C	
APPROVAL [Signature]		DATE 12/13/80		DRAWING NUMBER DW-00014C-0009	
				REV - 02 RELEASE CABLE 13	
				DATE 12-12-1990-15-21 SHEET 1 OF 1	



NOTES:

1. ALL 18 AND 22 AWG WIRE SHALL MEET OR EXCEED UL1061
2. COVER THIS JOINT SECTION WITH 3/8 INCH I.D. BENTLEY/HARRIS EXPANDED PT. TUBING. SECURE BOTH ENDS OF MESH WITH 1 INCH LONG PIECES OF HEAT SHRINK TUBING
3. TWO WIRES INSERTED INTO P1 PIN 3 AND CRIMPED
4. SPLICE TO ACCOMMODATE 3541" C.W.A. SOLDER AND HEAT SHRINK INSULATE NOTE BLACK 18 AWG TEFLON WIRE
5. BREAKOUT WIRES TO CENTER DETECT AT M1 TWIST WIRES TIE WRAP AT TWO INCH INTERVALS
6. SW1, SW2, SW3 AND CENTER DETECT PCB SHOWN FOR REFERENCE ONLY. ALL LEADS ARE STRIPPED AND SOLDER TINNED 1/4 IN LONG
7. R1 & R2 SOLDERED/CRIMPED IN-LINE AS SHOWN AND HEAT SHRINK INSULATED
8. SECURE WIRE ENDS HERE WITH ELECTRICAL TAPE FOR SHIPPING (THREE SEPARATE TAPED BUNDLES) TAPE: [Diagram of three taped bundles]
9. MARKER M1 HAS TWO LINES OF TEXT
10. ASSEMBLED HARNESS IS MFG P/N A18-00001-010

DRAFTER DAVID J. BELLAMY		DATE 2-10-90		MICROPROSE GAMES 380 LAKEFRONT DR., HUNT VALLEY, MD 21030	
CHECKED [Signature]		DATE 2-10-90		TITLE JOYSTICK HARNESS	
ENGINEER JAY G. MCKIBBIN		DATE 2-17-90		SIZE C	
APPROVAL [Signature]		DATE 2-17-90		DRAWING NUMBER DW-00014C-0010	
DATE 12-10-1990		DATE 12-10-1990		RELEASE JOYS. 2	
DATE 12-10-1990		DATE 12-10-1990		SHEET 2 OF 2	



WIRE LIST (ALL WIRE IS 22 AWG)				
SIGNAL	FROM	TO	COLOR	BELDEN PART NO
R AUDIO	J1-01	J2	WHT/BLK	9921-14
GND	J1-02	J3	BLACK	9921-10

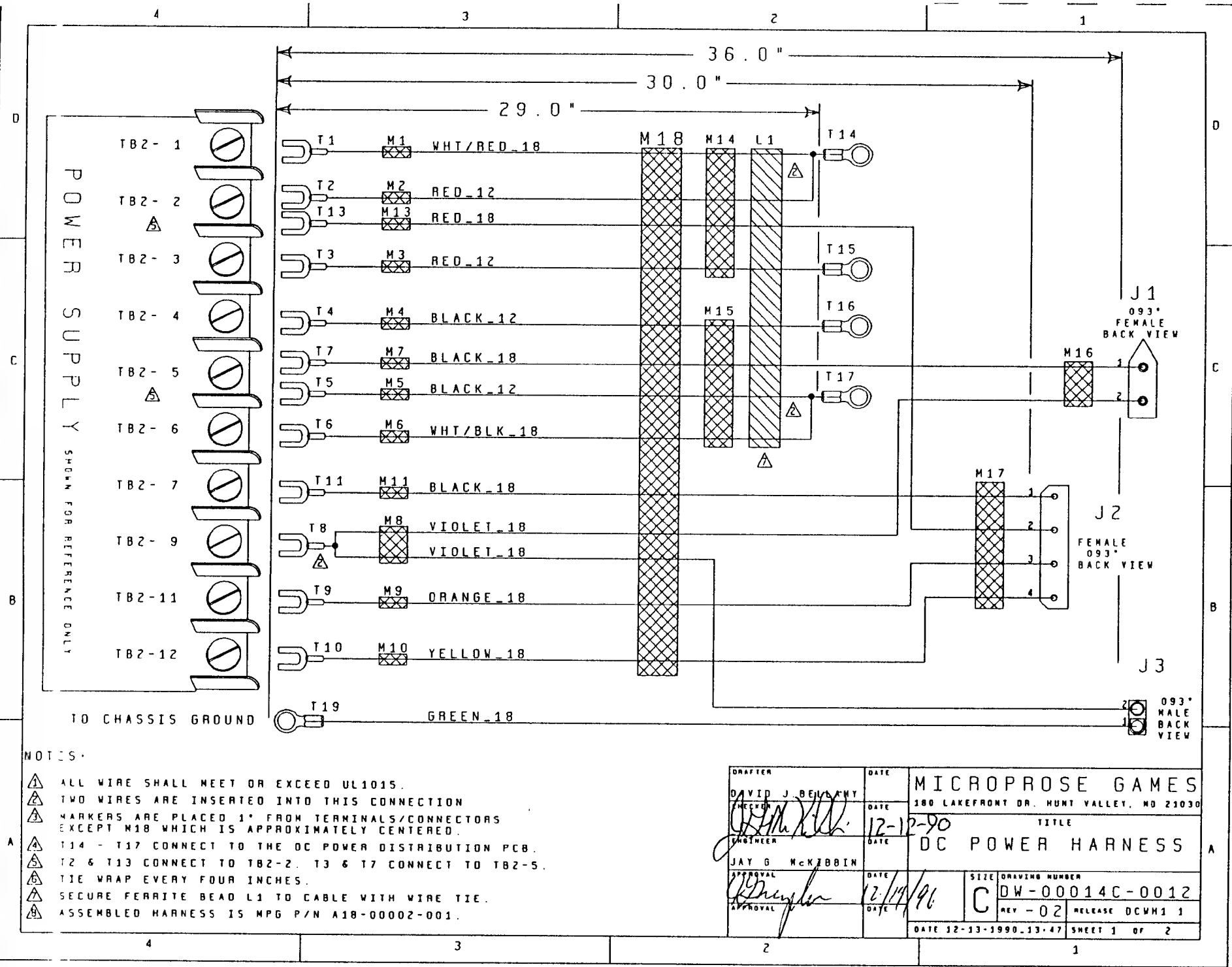
PARTS LIST			
REF DES	MFG	PART NO	PIN NO
J1	MOLEX	22-01-2021	08-50-0114
J2, J3	AMP	2-520181-4	

MARKER LIST				
REF DES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS.9-3758W	.125"	SOUND BD J5
M2	BRADY	HCPS.9-2508W	.125"	R SPKR
M3	BRADY	HCPS.9-2508W	.125"	R SPKR
M4	BRADY	HCPS1.9-3758W	.125"	(LINE 1) RIGHT SPEAKER CABLE (LINE 2) DW-00014C-0011-02

NOTES:

- 1) ALL 22 AWG WIRE SHALL MEET OR EXCEED UL1061.
- 2) TIE WRAP AT INTERVALS OF TWO INCHES.
- 3) MARKER M4 HAS TWO LINES OF TEXT.
- 4) TWIST WIRE PAIR AND TIE WRAP AT 4" INTERVALS.
- 5) ASSEMBLED CABLE IS MPG P/N A18-00001-0011

DRAFTER DAVID J. BELMONT		DATE 12-10-90		MICROPROSE GAMES	
CHECKER JAY G. McKIBBIN		DATE 12/14/90		180 LAKEFRONT DR. HUNT VALLEY, MO 24030	
APPROVAL [Signature]		DATE 12/14/90		TITLE RIGHT SPEAKER CABLE	
APPROVAL [Signature]		DATE 12/14/90		SIZE C	
				DRAWING NUMBER DW-00014C-0011	
				REV - 02 RELEASE CABLE 9	
				DATE 12-11-1990-10-12 SHEET 1 OF 1	



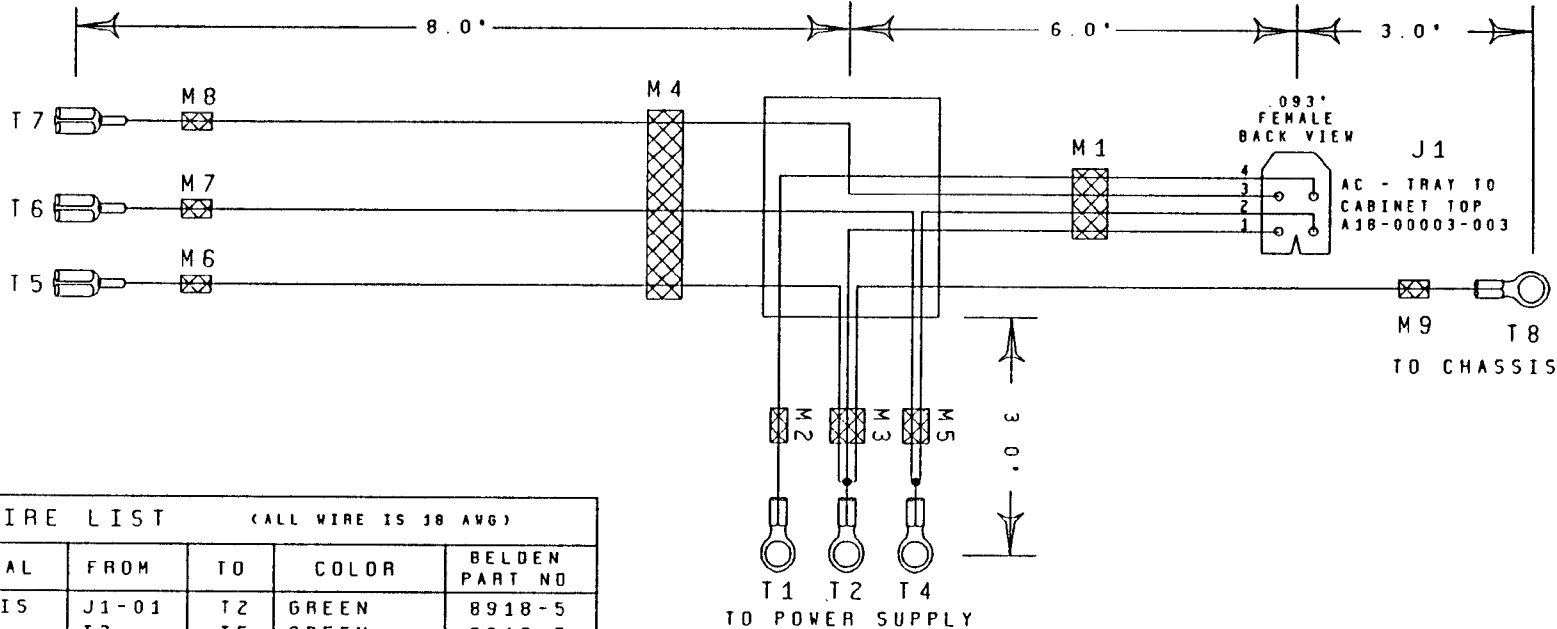
WIRE LIST					
SIGNAL	FROM	TO	COLOR	AWG	BELDEN PART NO
+SENSE	T1	T14	WHT/RED	18	8918-15
BKPLN_V1	T2	T14	RED	12	9912-2
BKPLN_V1	T3	T15	RED	12	9912-2
BKPLNRTN	T4	T16	BLACK	12	9912-10
BKPLNRTN	T5	T17	BLACK	12	9912-10
-SENSE	T6	T17	WHT/BLK	18	8918-14
FAN_RTN	T7	J1-1	BLACK	18	8918-10
FAN_V2	T8	J1-2	VIOLET	18	8918-7
PANEL_V2	T8	J3-2	VIOLET	18	8918-7
SND_V3	T9	J2-3	ORANGE	18	8918-3
SND_V4	T10	J2-4	YELLOW	18	8918-4
SND_RTN	T11	J2-1	BLACK	18	8918-10
SND_V1	T13	J2-2	RED	18	8918-2
CHAS_GND	T19	J3-1	GREEN	18	8918-5

PARTS LIST			
REFDES	MFG	PART NO	PIN NO
T1, T6, T7, T9, T10, T11, T13	MOLEX	AA-234-08X	
T2 - T5, T8	MOLEX	C-236-08X	
T14 - T17	MOLEX	D-656-10X	
T19	MOLEX	C-236-08X	
J1	MOLEX	03-06-1023	02-06-1101
J2	MOLEX	15-24-4048	02-08-1201
J3	MOLEX	19-09-1026	02-09-1117
L1	FAIR-RITE	2643164151	

MARKER LIST					
REF DES	MFG	PART NO	TEXT SIZE	TEXT	
				LINE 1	LINE 2
M1	BRADY	HCPS 9-2508W	.125"	+SENSE	TB2-1
M2	BRADY	HCPS 9-3336W	.125"	V1	TB2-2
M3	BRADY	HCPS 9-3336W	.125"	V1	TB2-3
M4	BRADY	HCPS 9-3336W	.125"	RETURN	TB2-4
M5	BRADY	HCPS 9-2508W	.125"	RETURN	TB2-5
M6	BRADY	HCPS 9-3336W	.125"	-SENSE	TB2-6
M7	BRADY	HCPS 9-3336W	.125"	RETURN	TB2-5
M8	BRADY	HCPS 9-3336W	.125"	V2	TB2-9
M9	BRADY	HCPS 9-2508W	.125"	V3	TB2-11
M10	BRADY	HCPS 9-2508W	.125"	V4	TB2-12
M11	BRADY	HCPS 9-2508W	.125"	RETURN	TB2-7
M13	BRADY	HCPS 9-2508W	.125"	V1	TB2-2
M14	BRADY	HCPS 9-5008W	.125"	VDD	
M15	BRADY	HCPS 9-5008W	.125"	GND	
M16	BRADY	HCPS 9-3758W	.125"	FAN	
M17	BRADY	HCPS 9-5008W	.125"	SOUND BOARD	
M18	BRADY	HCPS 9-1008W	.125"	DC POWER HARNESS	DW-00014C-0012-02

DRAFTER DAVID J. BELMONT		DATE 12-12-90		MICROPROSE GAMES	
DESIGNER JAY G. McKIBBIN		DATE 12-12-90		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
APPROVAL <i>[Signature]</i>		DATE 12/14/90		TITLE DC POWER HARNESS	
DATE 12-13-1990		SIZE C		DRAWING NUMBER DW-00014C-0012	
DATE 12-13-1990		SHEET 2		OF 2	

TO LINE EMI FILTER



WIRE LIST (ALL WIRE IS 18 AWG)				
SIGNAL	FROM	TO	COLOR	BELDEN PART NO
CHASSIS	J1-01	T2	GREEN	8918-5
	T2	T5	GREEN	8918-5
	T2	T8	GREEN	8918-5
COMMON	J1-02	T4	WHITE	8918-9
	T4	T6	WHITE	8918-9
UP SW LINE	J1-03	T7	WHT/BLK	8918-14
SW LINE	J1-04	T1	BLACK	8918-10

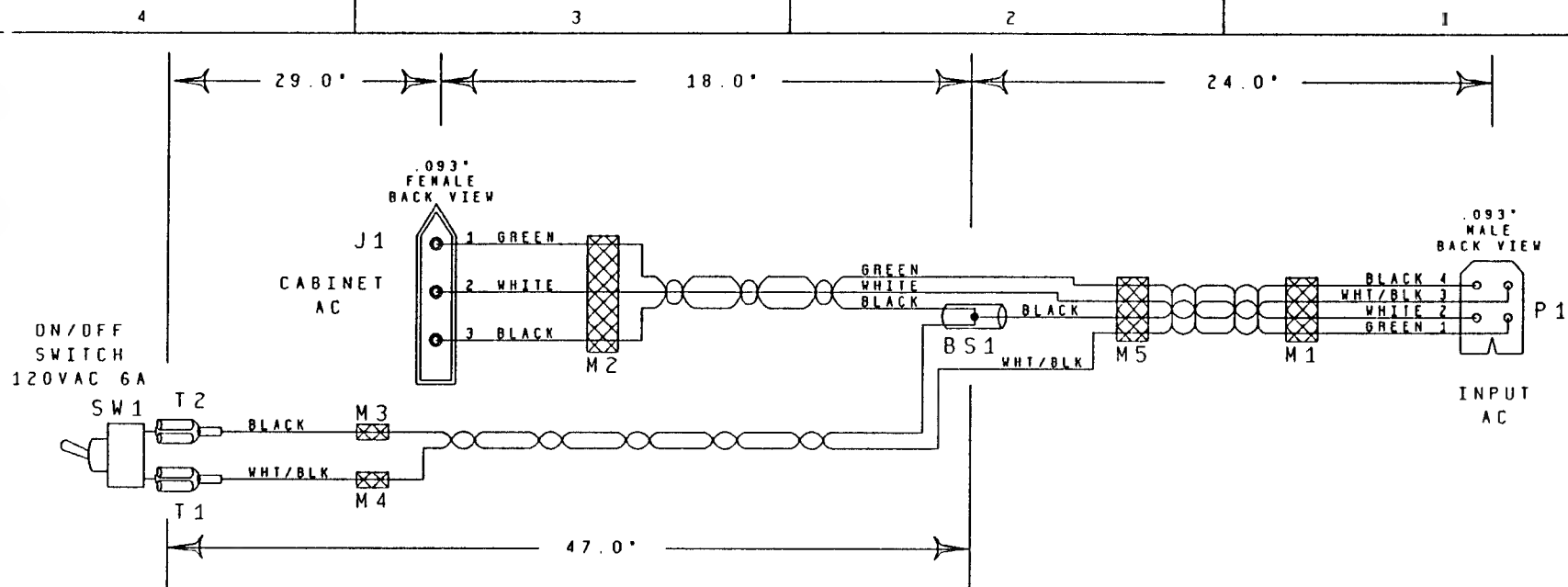
PARTS LIST			
REF DES	MFG	PART NO	PIN NO
J1	MOLEX	03-09-1049	02-09-1117
1	MOLEX	AA-232-08X	RING TERM
2	MOLEX	C-236-08X	RING TERM
T4, T8	MOLEX	BB-223-08X	RING TERM
T5 - T7	MOLEX	AA-2201C	PUSH-ON

MARKER LIST				
REF DES	MFG	PART NO	TEXT SIZE	TEXT
1	BRADY	HCPS 9-6258W	.125"	INPUT AC
2	BRADY	HCPS 9-2508W	.125"	TB1-1
3	BRADY	HCPS 9-5008W	.125"	TB1-3
4	BRADY	HCPS 1.9-6258W	.125"	(LINE 1) INPUT AC HARNESS (LINE 2) DW-00014C-0014-02
5	BRADY	HCPS 9-3758W	.125"	TB1-2
6	BRADY	HCPS 9-2508W	.125"	GND
7	BRADY	HCPS 9-2508W	.125"	COMM
8	BRADY	HCPS 9-2508W	.125"	LINE
9	BRADY	HCPS 9-2508W	.125"	GND

NOTES:

- 1) ALL 18 AWG WIRE SHALL MEET OR EXCEED UL1015.
- 2) TIE WRAP AT INTERVALS OF TWO INCHES.
- 3) MARKER M4 HAS TWO LINES OF TEXT.
- 4) TERMINAL T2 HAS 3 WIRES IN CRIMP.
- 5) TERMINAL T4 HAS 2 WIRES IN CRIMP.
- 6) BREAKOUT WIRES TO T1, T2 & T4. SECURE WITH TIE WRAP.
- 7) PLACE MARKERS M2 - M3 & M5 - M9 1" FROM TERMINALS.
- 8) ASSEMBLED HARNESS IS MPG P/N A18-00003-002.

DRAFTER DAVID J. BELLMY		DATE 12-12-90		MICROPROSE GAMES	
CHECKED <i>[Signature]</i>		DATE 12-12-90		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
DESIGNED JAY G. McKIBBIN		DATE 12/13/90		TITLE INPUT AC HARNESS	
APPROVAL <i>[Signature]</i>		DATE 12/13/90		SIZE C	
DRAWING NUMBER DW-00014A-0014		REV - 02		RELEASE ACW1.1	
DATE 12-12-1990		13		SHEET 1 OF 1	



WIRE LIST (ALL WIRE IS 18 AWG)

SIGNAL	FROM	TO	COLOR	BELDEN PART NO
CH SSIS	P1-01	J1-01	GREEN	8918-5
COMMON	P1-02	J1-02	WHITE	8918-9
UN WLINE	P1-03	T1	WHT/BLK	8918-14
SW LINE	P1-04	T2	BLACK	8918-10
	J1-03	T2	BLACK	8918-10

PARTS LIST

RECD'S	MFG	PART NO	PIN NO
J1	MOLEX	03-09-1032	02-09-1117
P1	MOLEX	03-09-2049	02-09-2116
T1	MOLEX	AA-2201C	PUSH-ON
T2	MOLEX	BB-2206C	PUSH-ON
BS1	T B D	T B D	

MARKER LIST

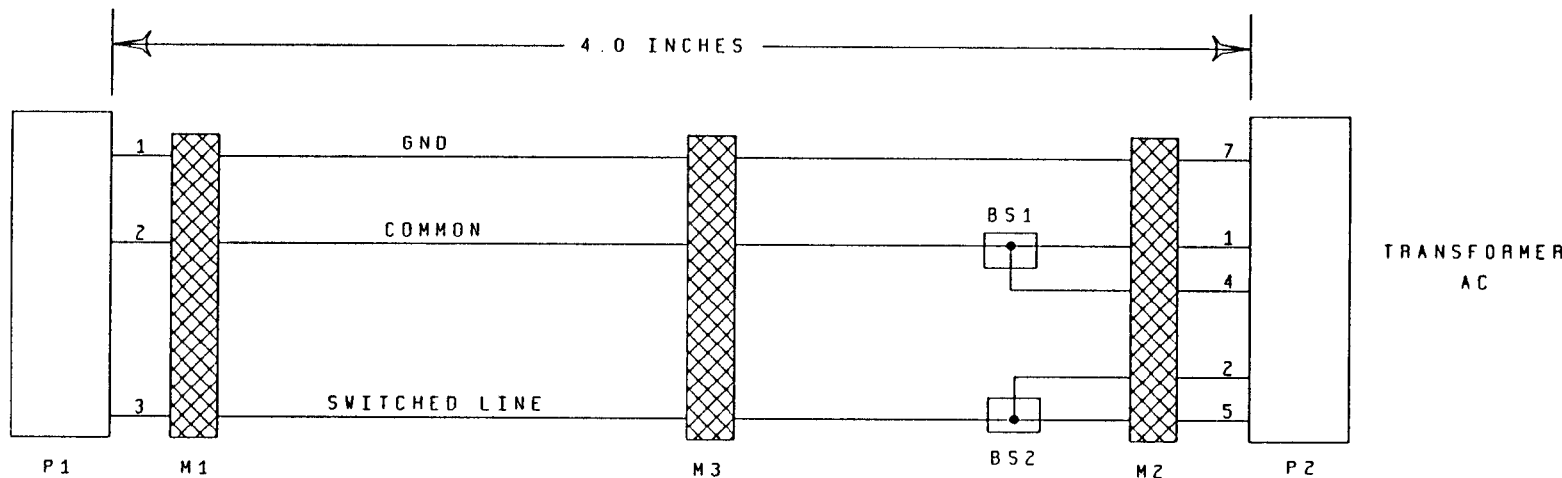
RECD'S	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS 9-6258W	.125"	INPUT AC
M2	BRADY	HCPS 9-5008W	.125"	CABINET AC
M3	BRADY	HCPS 9-3758W	.125"	SW LINE
M5	BRADY	HCPS 1.9-6258W	.125"	(LINE 1) AC-TRAY TO TOP HARN
				(LINE 2) DW-00014C-0015-02
M1	BRADY	HCPS 9-2508W	.125"	UNSW LINE

NOTES:

- 1) ALL 18 AWG WIRE SHALL MEET OR EXCEED UL1015
- 2) TIE WRAP AT INTERVALS OF TWO INCHES.
- 3) MARKER M5 HAS TWO LINES OF TEXT.
- 4) BUTT SPLICE BS1 HAS 3 WIRES IN CRIMP.
- 5) TWIST WIRES FROM P1 TO J1 AND FROM BS1 TO TERMINALS.
- 6) BREAKOUT WIRES AT BS1. SECURE WITH TIE WRAP.
- 7) SW1 IS SHOWN FOR REFERENCE ONLY.
- 8) ASSEMBLED HARNESS IS MPG P/N A18-00003-003.

DRAFTER DAVID J. BELAMY		DATE 12-13-90	MICROPROSE GAMES	
CHECKED JAY G. McKIBBIN		DATE 12/14/90	180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
APPROVAL JAY G. McKIBBIN		DATE 12/14/90	TITLE AC - TRAY TO CABINET TOP	
APPROVAL JAY G. McKIBBIN		DATE 12/14/90	SIZE C	DRAWING NUMBER DW-00014A-0015
			REV - 02	RELEASE ACW2 1
			DATE 12-13-1990-13-28	SHEET 1 OF 1

INPUT
AC



PARTS LIST

REFDES	DESCRIPTION	PART NO	PIN NO
P1	CONNECTOR, PLUG	MOLEX 03-09-2032	02-09-2116
P2	CONNECTOR, RECEPTICAL	MOLEX 03-09-1094	02-09-1117
BS1	16 AWG BUTT SPLICE	MOLEX C-246X	
BS2			

WIRE LIST

SIGNAL	FROM	TO	COLOR	BELDEN PART NO
GROUND	P1-1	P2-7	GREEN	9918-5
COMMON	P1-2	BS1	WHITE/ORANGE	9918-20
COMMON	BS1	P2-1	WHITE/ORANGE	
COMMON	BS1	P2-4	WHITE/ORANGE	
SWITCHED LINE	P1-3	BS2	VIOLET	9918-7
SWITCHED LINE	BS2	P2-2	VIOLET	
SWITCHED LINE	BS2	P2-5	VIOLET	

MARKER LIST

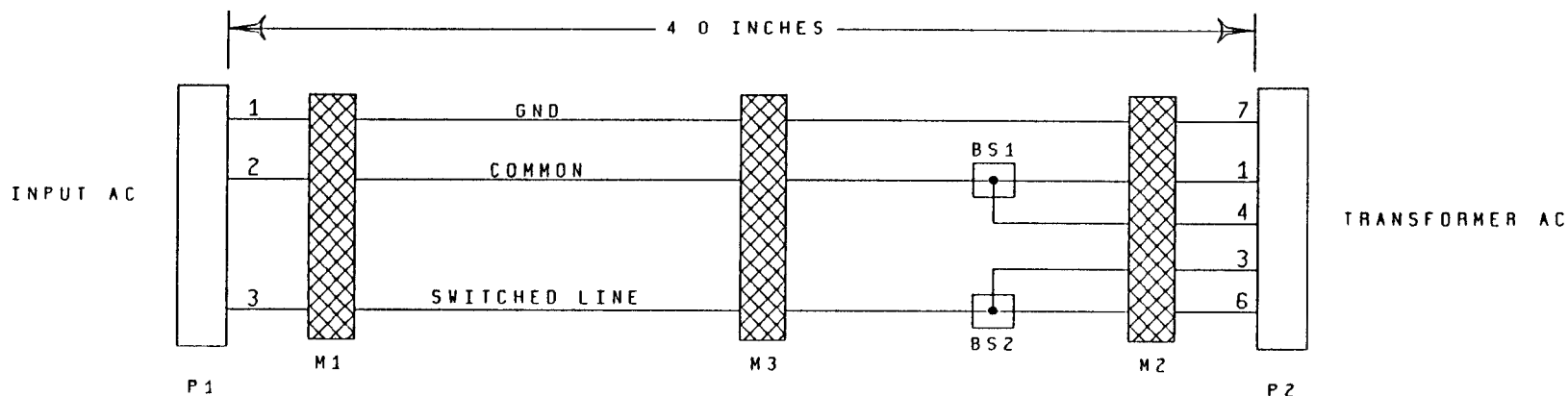
REFDES	TYPE SIZE	MFG	PART NO	TEXT	
				LINE 1	LINE 2
M1	.125"	BRADY	HCPS 9-8336W	100VAC	INPUT AC
M2	.125"	BRADY	HCPS 9-8336W	100VAC	XFORMER AC
M3	.125"	BRADY	HCPS 9-8336W	OW-00014A-0016-02	100VAC SELECT

COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION

MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

NOTES: 1) ALL WIRE MUST MEET OR EXCEED UL1015.
2) LABEL MARKERS:

DRAFTER DAVID J BELLAMY		DATE 12-10-90		MICROPROSE GAMES	
CHECKER 		DATE 12-10-90		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER JAY G McKIBBIN		DATE 12/13/90		TITLE 100V AC VOLTAGE SELECTION HARNESS	
APPROVAL 		DATE 12/13/90		SIZE C	
APPROVAL		DATE		DRAWING NUMBER OW-00014A-0016	
				REV - 02	
				RELEASE ACWHS.1	
				DATE 12-11-1990-10-31	
				SHEET 1 OF 1	



PARTS LIST

REFDES	DESCRIPTION	PART NO	PIN NO
P1	CONNECTOR, PLUG	MOLEX 03-09-2032	02-09-2116
P2	CONNECTOR, RECEPTICAL	MOLEX 03-09-1094	02-09-1117
BS1	16 AWG BUTT SPLICE	MOLEX C-246X	
BS2			

WIRE LIST

SIGNAL	FROM	TO	COLOR	BELDEN PART NO
GROUND	P1-1	P2-7	GREEN	8918-5
COMMON	P1-2	BS1	WHITE	8918-9
COMMON	BS1	P2-1	WHITE	
COMMON	BS1	P2-4	WHITE	
SWITCHED LINE	P1-3	BS2	BLACK	8918-10
SWITCHED LINE	BS2	P2-3	BLACK	
SWITCHED LINE	BS2	P2-6	BLACK	

MARKER LIST

REFDES	TYPE SIZE	MFG	PART NO	TEXT	
				LINE 1	LINE 2
M1	.125"	BRADY	HCPS 9-8336W	120VAC	INPUT AC
M2	.125"	BRADY	HCPS 9-8336W	120VAC	XFORMER AC
M3	.125"	BRADY	HCPS 9-8336W	0W-00014A-0016-02	120VAC SELECT

COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION

MICROPROSE Games

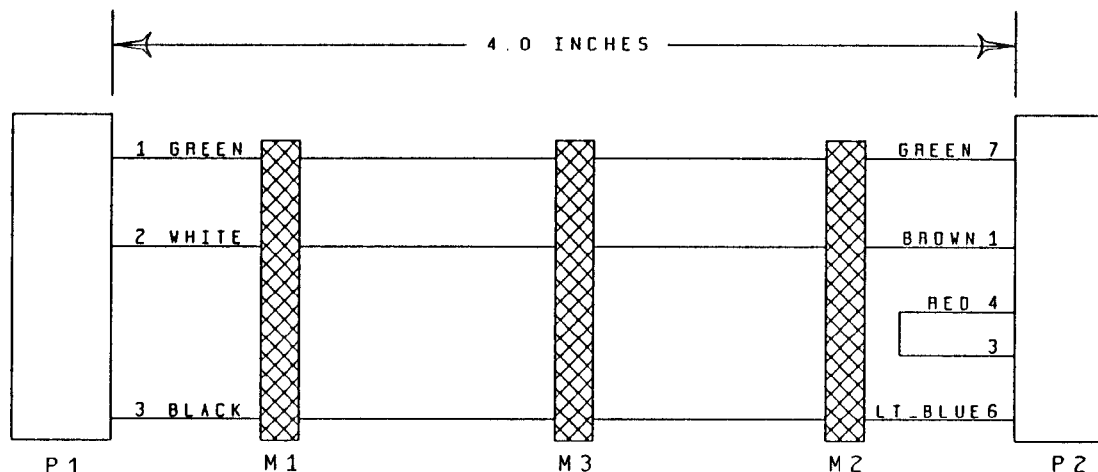
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

NOTES: 1) ALL WIRE MUST MEET OR EXCEED UL1015.

DRAFTER DAVID J. BELVANY		DATE 12-12-90		MICROPROSE GAMES	
CHECKED JAY G. McKIBBIN		DATE 12-12-90		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
APPROVAL JAY G. McKIBBIN		DATE 12-12-90		TITLE 120VAC VOLTAGE SELECTION HARNESS	
APPROVAL JAY G. McKIBBIN		DATE 12-12-90		SIZE C	
				DRAWING NUMBER 0W-00014A-0017	
				REV - 02	
				RELEASE ACWH3 1	
				DATE 12-12-1990-13-35	
				SHEET 1 OF 1	

INPUT
AC

TRANSFORMER
AC



PARTS LIST

FEFDES	DESCRIPTION	PART NO	PIN NO
P1	CONNECTOR, PLUG	MOLEX 03-09-2032	02-09-2116
P2	CONNECTOR, RECEPTICAL	MOLEX 03-09-1094	02-09-1117

WIRE LIST

SIGNAL	FROM	TO	COLOR	BELDEN PART NO
GROUND	P1-1	P2-7	GREEN	8918-5
COMMON	P1-2	P2-1	BROWN	8918-1
SWITCHED LINE	P1-3	P2-6	LT. BLUE	8918-6
SWITCHED LINE	P2-3	P2-4	RED	8918-2

MARKER LIST

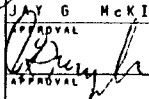
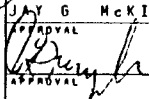
FEFDES	TYPE SIZE	MFG	PART NO	TEXT	
				LINE 1	LINE 2
M1	.125"	BRADY	HCPS 9-8336W	240VAC	INPUT AC
M2	.125"	BRADY	HCPS 9-8336W	240VAC	XFORMER AC
M3	.125"	BRADY	HCPS 9-8336W	DW-00014A-0016-02	240VAC SELECT

COMPANY / PROPRIETARY
CONFIDENTIAL / INFORMATION

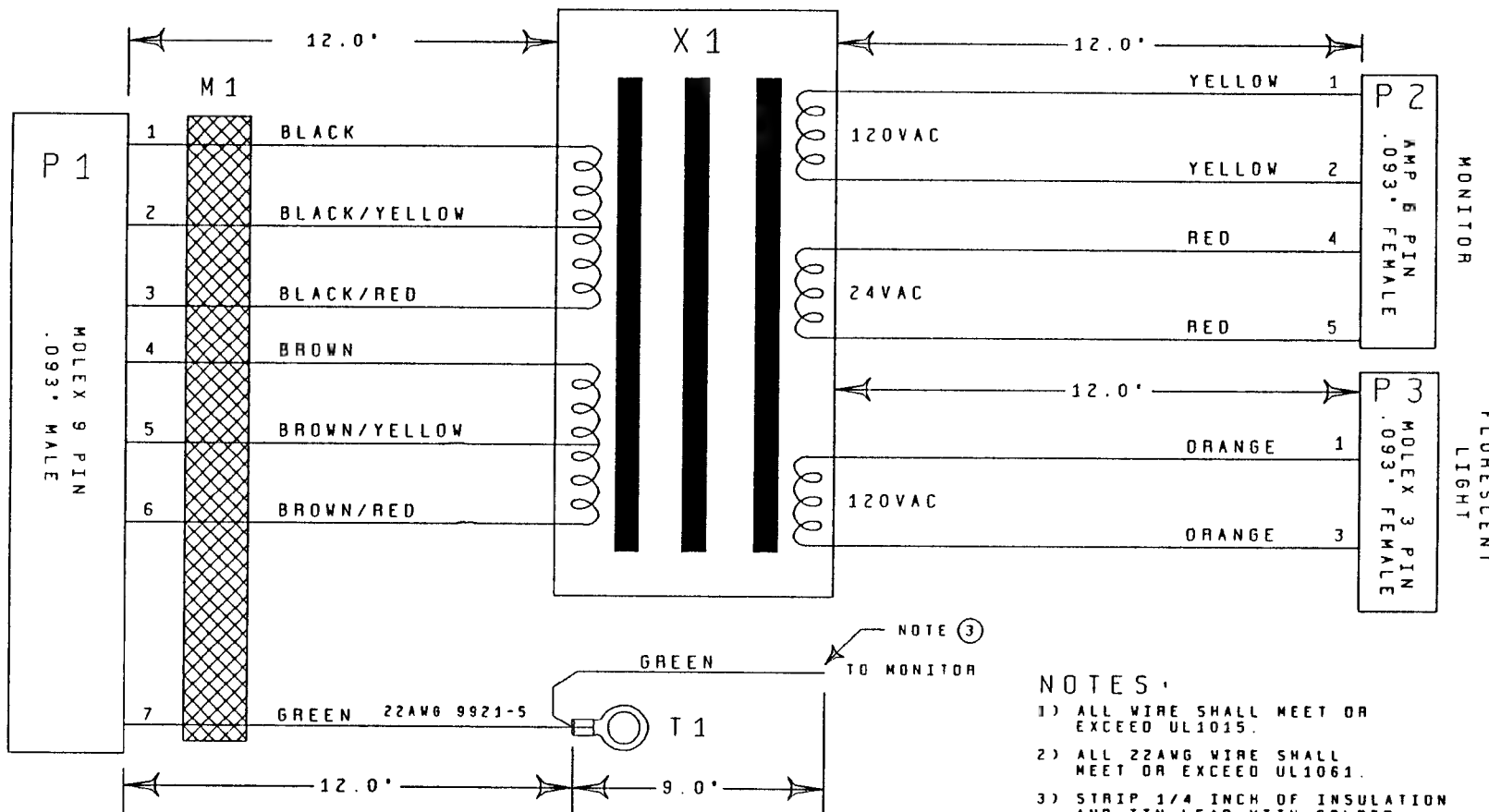
MICROPROSE Games
180 LAKEFRONT DR. HUNT VALLEY, MD 21030

NOTES: 1) ALL WIRE MUST MEET OR EXCEED OF UL1015

2) LABEL MARKERS: 

DRAFTER DAVID J. BELLAARD		DATE 12-12-90		MICROPROSE GAMES 180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER JAY G. McKIBBIN		DATE 12/18/90		TITLE 240 VAC VOLTAGE SELECTOR HARNESS	
APPROVAL 		DATE 12/18/90		SIZE C	
APPROVAL 		DATE 12/18/90		DRAWING NUMBER DW-00014A-0018	
				REV - 02 RELEASE ACW# 1	
				DATE 12-13-1990-14-12 SHEET 1 OF 1	

AC VOLTAGE SELECTOR
HARNES



NOTES:

- 1) ALL WIRE SHALL MEET OR EXCEED UL1015.
- 2) ALL 22AWG WIRE SHALL MEET OR EXCEED UL1061.
- 3) STRIP 1/4 INCH OF INSULATION AND TIN LEAD WITH SOLDER.
- 4) ATTACH T1 TO LOWER TRANSFORMER LAMINATE BOLT. USE A STAR LOCKWASHER TO MAINTAIN ELECTRICAL CONTACT.
- 5) MARKER M1 HAS TWO LINES OF TEXT.
- 6) ASSEMBLED TRANSFORMER IS MPG P/N A18-00003-007.

PARTS LIST

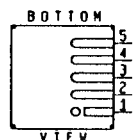
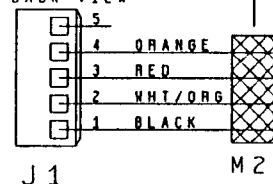
REF DES	MFG	PART NO	PIN NO
1	MOLEX	03-09-2091	02-09-2116
2	AMP	350715-1	350536-1
3	MOLEX	03-09-1032	02-09-1117
4	MIDWESTCO	#U53P218A	
5	MOLEX	C-235-08X	

MARKER LIST

REF DES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS1.9-100BW	.125"	(LINE 1) TRANSFORMER ASSEMBLY (LINE 2) DW-00014C-0019-02

DRAFTER DAVID J. BELLAMY		DATE 12-10-90	MICROPROSE GAMES	
CHECKER JAY G. McKIBBIN		DATE 12-13-90	180 LAKEFRONT DR. MOUNT VALLEY, MD 21030	
ENGINEER JAY G. McKIBBIN		DATE 12-13-90	TITLE TRANSFORMER ASSEMBLY	
APPROVAL [Signature]		DATE 12-13-90	SIZE C	DRAWING NUMBER DW-00014A-0019
APPROVAL [Signature]		DATE 12-13-90	REV - 02	RELEASE XFORM 1
DATE 12-13-1990, 16:35			SHEET 1 OF 1	

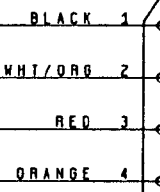
OP 1

FEMALE
BACK VIEW

M2

M3

M1

MALE
.093"
BACK VIEW

P 1

WIRE LIST

(ALL WIRE IS 22 AWG)

SIGNAL	FROM	TO	COLOR	BELOEN PART NO
XJOY_GND	P1-01	J1-01	BLACK	9921-10
XJOY_CHA	P1-02	J1-02	ORANGE	9921-3
XJOY_+5V	P1-03	J1-03	RED	9921-2
XJOY_CHB	P1-04	J1-04	WHT/ORG	9921-20

PARTS LIST

REFDES	MFG	PART NO	PIN NO
P1	MOLEX	03-09-2042	02-09-2118
J1	BERG	65039-032	
J1	MOLEX		02-09-2116
J1	BERG	KEY PLUG	65307-001

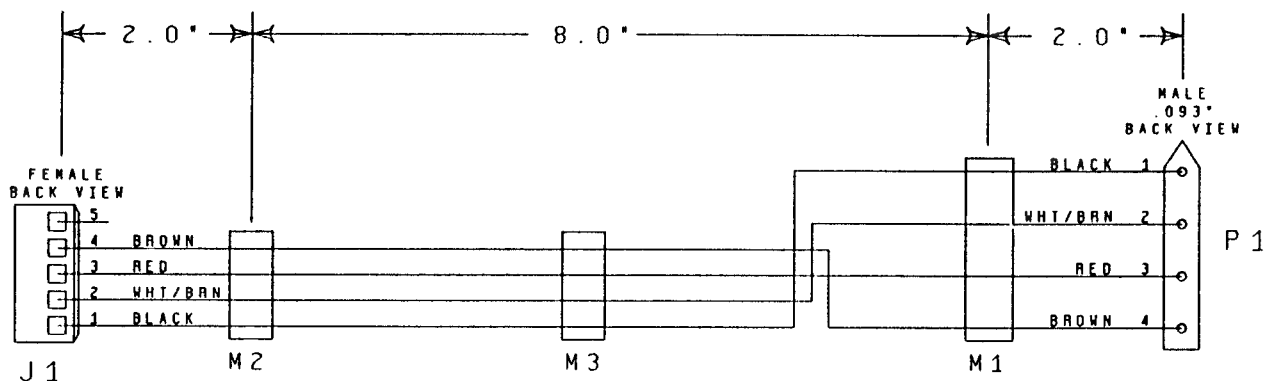
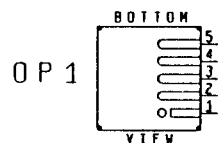
MARKER LIST

REFDES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS.9-3758W	.125"	JOYSTICK
M2	BRADY	HCPS.9-3758W	.125"	XPOT
M3	BRADY	HCPS1.9-3758W	.125"	(LINE 1) X JOYSTICK CABLE (LINE 2) DW-00014C-0023-02

NOTES:

- 1) ALL 22 AWG WIRE SHALL MEET OR EXCEED UL1061
- 2) TIE WRAP AT INTERVALS OF TWO INCHES.
- 3) MARKER M3 HAS TWO LINES OF TEXT.
- 4) WIRES ARE TWISTED BETWEEN MARKERS M1 AND M2.
- 5) INSTALL KEY PLUG IN PIN 5 OF J1
- 6) CLIP PIN5 FROM OPTICAL ENCODER OP1.
- 7) OPTICAL ENCODER OP1 IS SHOWN FOR REFERENCE ONLY.
- 8) ASSEMBLED CABLE IS MPG P/N A18-00001-013.

DRAFTER DAVID J. BECKMY		DATE 12-12-90	MICROPROSE GAMES 180 LAKEFRONT DR HUNT VALLEY, MO 24030	
CHECKED JAY G. McKIBBIN		DATE 12-14-91	TITLE X JOYSTICK CABLE	
APPROVAL JAY G. McKIBBIN		DATE 12-14-91	SIZE C	DRAWING NUMBER DW-00014C-0023
APPROVAL		DATE	REV - 02	RELEASE CABLE J1
DATE 12-13-1990.16.09			SHEET 3 OF 3	



WIRE LIST (ALL WIRE IS 22 AWG)

SIGNAL	FROM	TO	COLOR	BELDEN PART NO
YJOY_GND	P1-01	J1-01	BLACK	9921-10
YJOY_CHA	P1-02	J1-02	BROWN	9921-1
YJOY_+5V	P1-03	J1-03	RED	9921-2
YJOY_CHB	P1-04	J1-04	WHT/BRN	9921-19

PARTS LIST

REFDES	MFG	PART NO	PIN NO
P1	MOLEX	03-09-2042	02-09-2118
J2	BERG	65039-032	
J1	MOLEX		02-09-2116
J1	BERG	KEY PLUG	65307-001

MARKER LIST

REFDES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS.9-3758W	.125"	JOYSTICK
M2	BRADY	HCPS.9-3758W	.125"	YPOT
M3	BRADY	HCPS1.9-3758W	.125"	(LINE 1) Y JOYSTICK CABLE (LINE 2) DW-00014C-0024-02

NOTES:

- 1) ALL 22 AWG WIRE SHALL MEET OR EXCEED UL1061.
- 2) TIE WRAP AT INTERVALS OF TWO INCHES.
- 3) MARKER M3 HAS TWO LINES OF TEXT.
- 4) WIRES ARE TWISTED BETWEEN MARKERS M1 AND M2.
- 5) INSTALL KEY PLUG IN PIN 5 OF J1.
- 6) CLIP PIN5 FROM OPTICAL ENCODER OP1.
- 7) OPTICAL ENCODER OP1 SHOWN FOR REFERENCE ONLY.
- 8) ASSEMBLED CABLE IS MPG P/N A18-00001-012.

DRAFTER DAVID J. BELLAMY		DATE 12/12/90		MICROPROSE GAMES	
CHECKED JAY G. McKIBBIN		DATE 10/14/90		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
APPROVAL [Signature]		DATE 10/14/90		TITLE Y JOYSTICK CABLE	
APPROVAL [Signature]		DATE 10/14/90		SIZE C	
				DRAWING NUMBER DW-00014C-0024	
				REV - 02	
				RELEASE CABLE 10	
				DATE 12-13-1990-18-02	
				SHEET 1 OF 1	

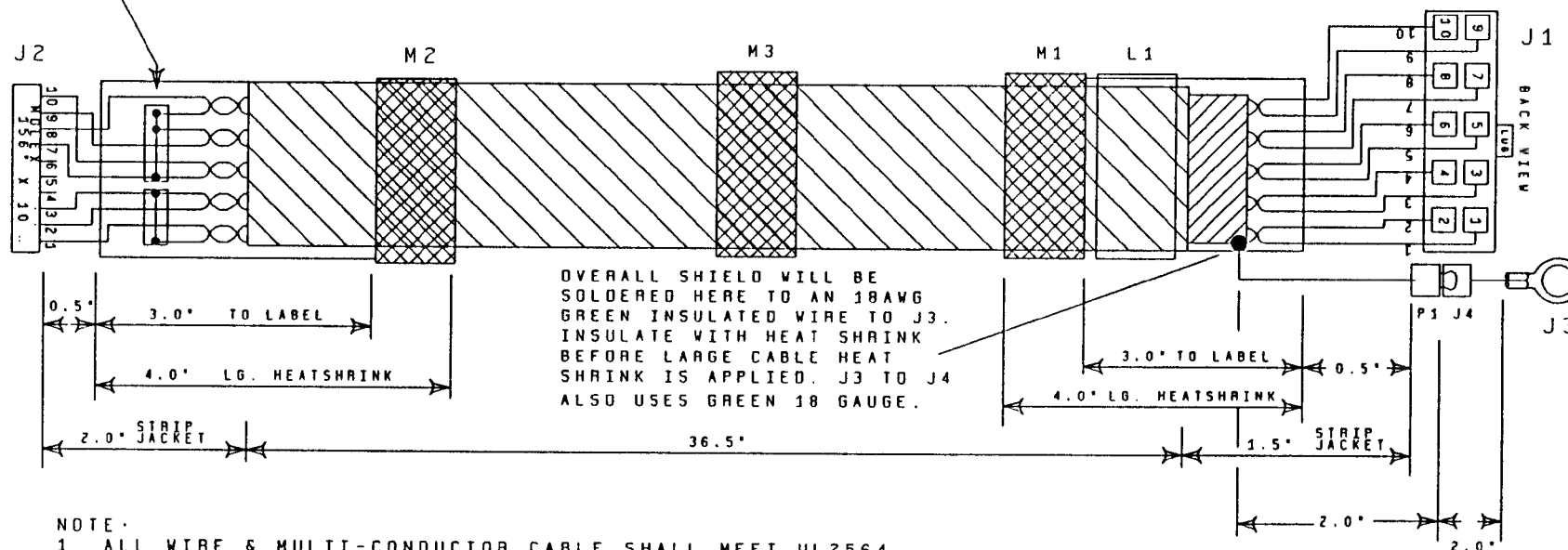
WIRE LIST				
SIGNAL	FROM	COLOR	TO	COLOR
DDND	J1-01	BLACK	J2-3	BLACK
HSYNC	J1-02	YELLOW	J2-1	YELLOW
VSYNC	J1-03	WHT/BLK	J2-2	WHT/BLK
DDND	J1-04	BLK/WHT	J2-3	WHT/BLK
AGND	J1-05	VIOLET	J2-7	
RED	J1-06	RED	J2-10	RED
GREEN	J1-07	GREEN	J2-9	GREEN
AGND	J1-08	ORANGE	J2-7	
AGND	J1-09	BROWN	J2-7	BROWN
BLUE	J1-10	BLUE	J2-8	BLUE

USE BELDEN CABLE, TRADE NO. 9505

PART LISTS			
REFDES	MFG	PART NO.	PIN NO.
J1	DUPONT	65846-010	47389-000
J2	MOLEX	09-50-7101	08-55-0106
J3	MOLEX	C-236-08X	
J4	AMP	2-520183-2	
P1	AMP	2-520102-2	
L1	FAIR-RITE	2643802702	

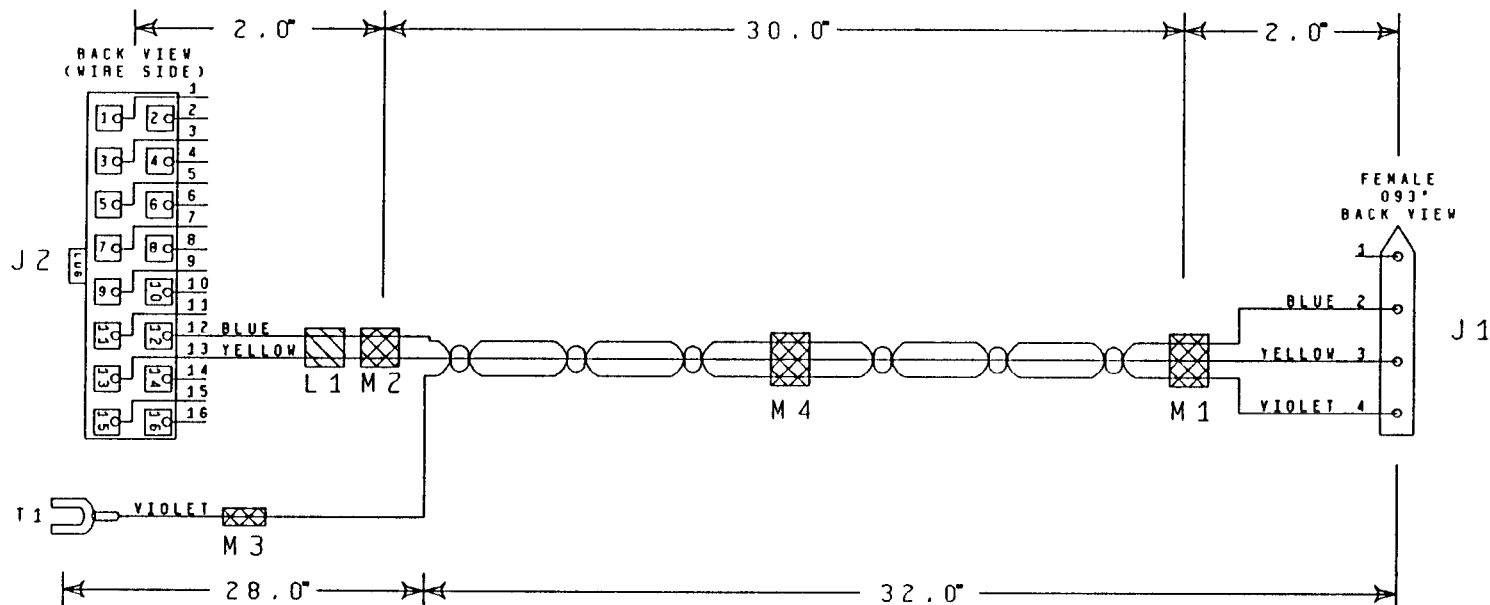
MARKERS			
REFDES	MFG	PART NO	TEXT
M1	BRADY	LAT-4-619-10	.125" V6B J1
M2	BRADY	LAT-4-619-10	.125" V-6 MONITOR P200
M3	BRADY	LAT-6-619-10	.125" (LINE 2) DISPLAY CABLE
			(LINE 2) DW-00014C-0025-02

SOLDER BLACK WIRES FROM ASSOCIATED TWISTED PAIR AS INDICATED. COVER WITH HEAT SHRINK AS SHOWN BEFORE LARGE CABLE HEAT SHRINK IS APPLIED.



- NOTE:
- 1 ALL WIRE & MULTI-CONDUCTOR CABLE SHALL MEET UL2564.
 2. CABLE WILL LOOP AROUND AND THRU L1.
 - 3 WIRES SOLDERED AND INSULATED WITH HEAT SHRINK.
 - 4 LABEL MARKERS.
 5. CABLE JACKET.
 - 6 OVERALL SHIELD.
 - 7 ASSEMBLED CABLE IS MPG P/N A18-00003-010.

DRAFTER DAVID J. BELYAMY		DATE 12-12-80		MICROPROSE GAMES	
CHECKED JAY G. McKIBBIN		DATE 12-13-80		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
APPROVAL JAY G. McKIBBIN		DATE 12-13-80		TITLE DISPLAY CABLE	
REVISION C		DATE 12-13-80		MONOCABLE	
SIZE C		DRAWING NUMBER DW-00014C-0025		REV - 02	
DATE		SHEET 1 OF 1		RELEASE	



WIRE LIST (ALL WIRE IS 22 AWG)

SIGNAL	FROM	TO	COLOR	BELOEN PART NO
SH_YEL	J1-02	J2-12	DK BLUE	9921-13
SH_RED	J1-03	J2-13	YELLOW	9921-4
SH_12V	J1-04	T1	VIOLET	9921-7

PARTS LIST

REFDES	MFG	PART NO	PIN NO
J1	MOLEX	03-09-1042	02-09-5142
J2	MOLEX	14-57-1161	
L1	FAIR-RITE	2643164251	
T1	MOLEX	AA-234-08X	

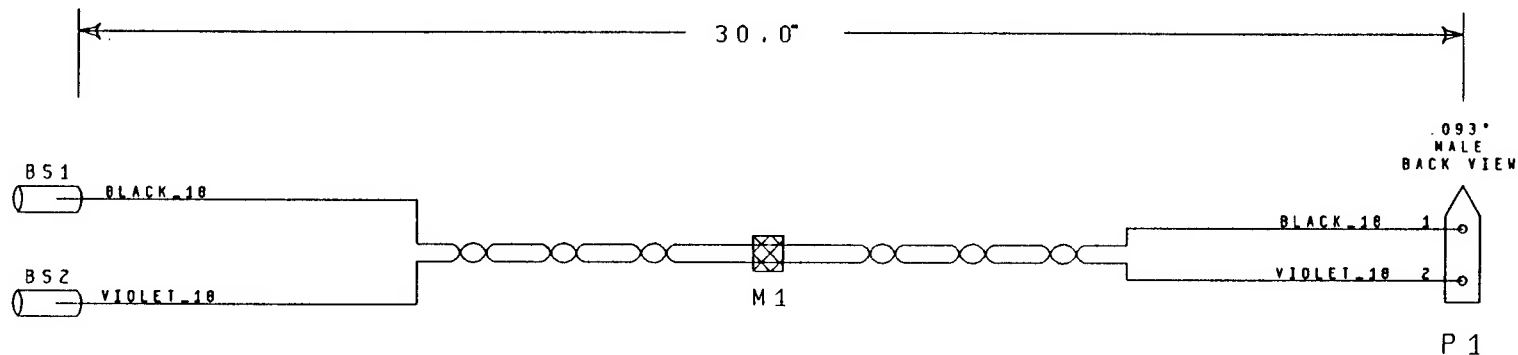
MARKER LIST

REFDES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS.9-3758W	.125"	HOST TO SHROUD
M2	BRADY	HCPS.9-3336W	.125"	HOST P4
M2	BRADY	HCPS.9-2508W	.125"	PWR SUP TB2-9
M4	BRADY	HCPS1.9-3758W	.125"	(LINE 1) LOWER SHROUD HARNESS (LINE 2) DW-00014C-0026-02

NOTES:

- 1) ALL 22 AWG WIRE SHALL MEET OR EXCEED UL1061.
- 2) TIE WRAP AT INTERVALS OF FOUR INCHES.
- 3) MARKER M4 HAS TWO LINES OF TEXT.
- 4) WIRES ARE TWISTED BETWEEN MARKERS M1 AND M2
- 5) PINS 1, 2, 15 & 16 OF J2 MUST BE POPULATED.
- 6) SECURE L1 WITH ELECTRICAL TAPE.
- 7) ASSEMBLED HARNESS IS MPG P/N A18-00003-013

DRAFTER DAVID J. BELLAMY		DATE 12-17-90		MICROPROSE GAMES	
CHECKER JAY G. McKIRBIN		DATE 12/18/90		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER				TITLE LOWER SHROUD HARNESS	
APPROVAL C. J. [Signature]		DATE 12/18/90		SIZE C	
DRAWING NUMBER DW-00014C-0026		REV - 02		RELEASE CABLE 12	
DATE 12-13-1990 16:33		SHEET 3 OF 1			



WIRE LIST (ALL WIRE IS 18 AWG)				
SIGNAL	FROM	TO	COLOR	BELDEN PART NO
ANGND	P1-01	BS1	BLACK	8918-10
AN12V	P1-02	BS2	VIOLET	8918-7

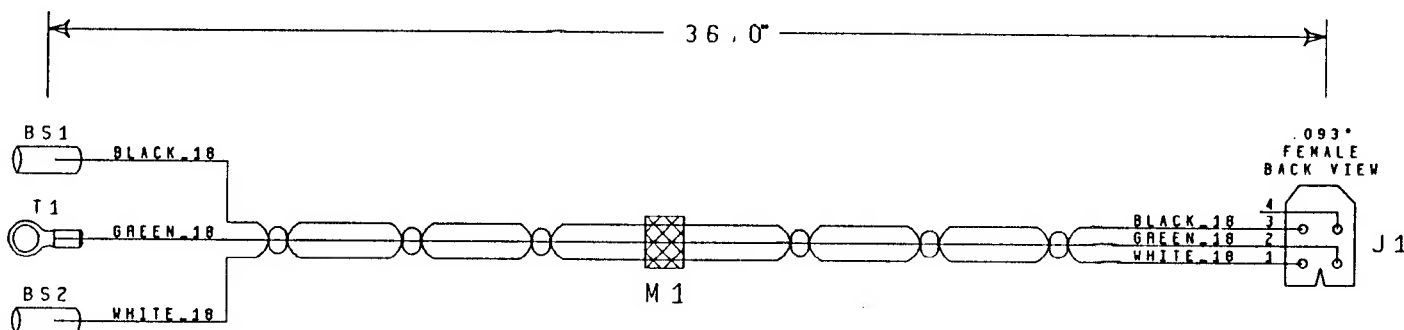
NOTES

- 1) ALL 18 AWG WIRE SHALL MEET OR EXCEED UL1015.
- 2) TIE WRAP AT INTERVALS OF FOUR INCHES.
- 3) MARKER M1 HAS TWO LINES OF TEXT.
- 4) WIRES ARE TWISTED.
- 5) CRIMP ONE END ONLY OF BUTT SPLICES BS1 & BS2.

PARTS LIST			
REFDES	MFG	PART NO	PIN NO
P1	MOLEX	03-06-2023	02-06-2101
BS1	T.B.O.		
BS2	T.B.O.		

MARKER LIST				
REFDES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS1.9-3758W	.125"	(LINE 1) FAN EXTEND HARNESS (LINE 2) DW-00014C-0027-02

DRAFTER DAVID J. BELMONT		DATE 12-12-50		MICROPROSE GAMES	
DESIGNER JAY G. McKIBBIN		DATE 12/19/50		180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
APPROVAL [Signature]		DATE 12/19/50		TITLE DC FAN EXTENSION CABLE	
APPROVAL [Signature]		DATE 12/19/50		DRAWING NUMBER DW-00014A-0027	
				REV - 02 RELEASE CABLE 17	
				DATE 12-12-1990, 14-38 SHEET 1 OF 1	



WIRE LIST (ALL WIRE IS 18 AWG)				
SIGNAL	FROM	TO	COLOR	BELDEN PART NO
FEUTL	J1-01	BS2	WHITE	8918-10
CHASSIS	J1-02	T1	GREEN	8918-5
DOT	J1-03	BS1	BLACK	8918-9

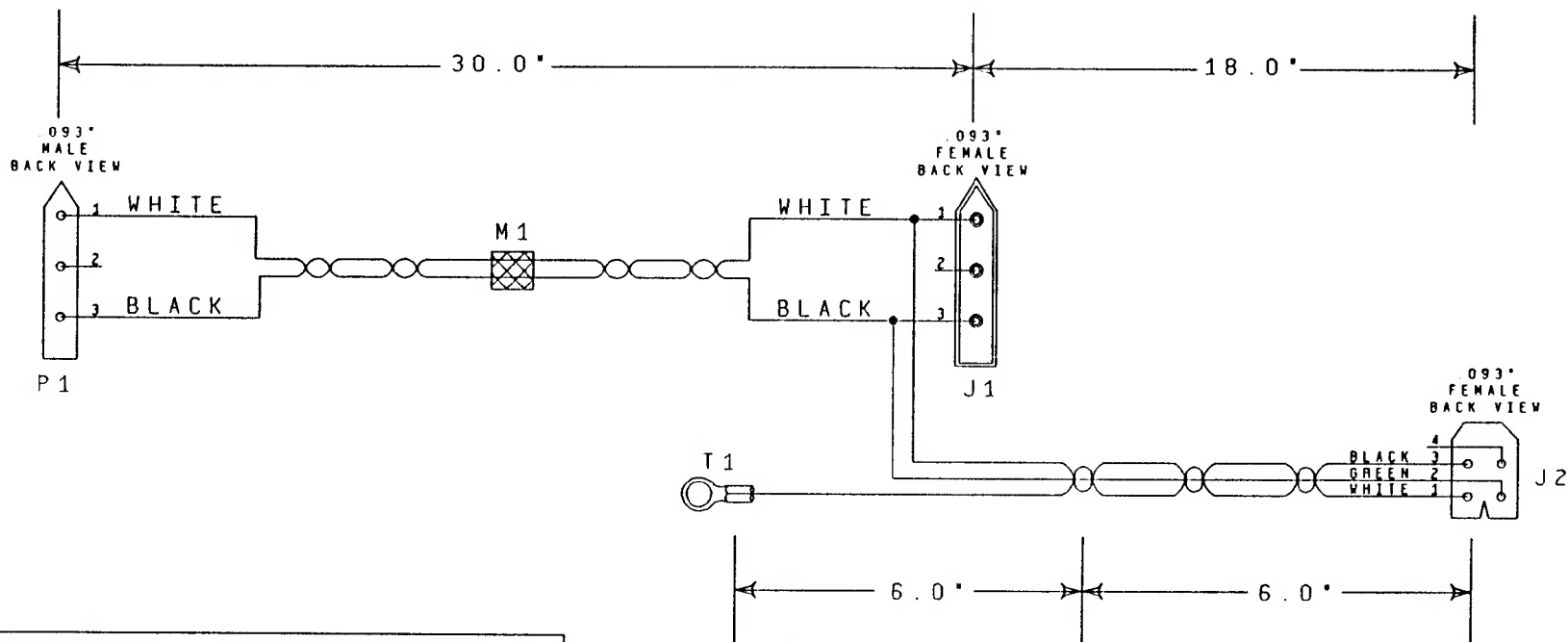
PARTS LIST			
REFDES	MFG	PART NO	PIN NO
P1	MOLEX	03-09-2049	02-09-2116
T1	MOLEX	C-236-08X	

MARKER LIST				
REFDES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS1.9-3758W	.125"	(LINE 1) AC-MARQUEE HARNESS (LINE 2) DW-00014C-0028-02

NOTES

- 1) ALL 18 AWG WIRE SHALL MEET OR EXCEED UL1015.
- 2) TIE WRAP AT INTERVALS OF FOUR INCHES.
- 3) MARKER M1 HAS TWO LINES OF TEXT.
- 4) WIRES ARE TWISTED
- 5) CRIMP ONLY ONE END OF BUTT SPLICES BS1 & BS2.
- 6) ASSEMBLED HARNESS IS MPG P/N A18-00003-014.

DRAFTER DAVID J. BELLAMY		DATE 12-12-80		MICROPROSE GAMES	
CHECKED JAY G. McKIBBIN		DATE 12/14/80		180 LAKEFRONT DR. HUNT VALLEY, MO 23030	
APPROVAL JAY G. McKIBBIN		DATE 12/14/80		TITLE AC - MARQUEE HARNESS	
APPROVAL		DATE		SIZE C	
				DRAWING NUMBER DW-00014A-0028	
				REV - 02	
				RELEASE CABLE 15	
				DATE 12-13-1990.14-25	
				SHEET 1 OF 1	



WIRE LIST (ALL WIRE IS 18 AWG)				
SIGNAL	FROM	TO	COLOR	BELOEN PART NO
X2PANCOM	P1-01	J1-01	WHITE	8918-9
X2PANHOT	P1-03	J1-03	BLACK	8918-10
P2MARCOM	J1-01	J2-01	WHITE	8918-9
P2MARHOT	J1-03	J2-03	BLACK	8918-10
CHASSIS	J2-02	T1	GREEN	8918-5

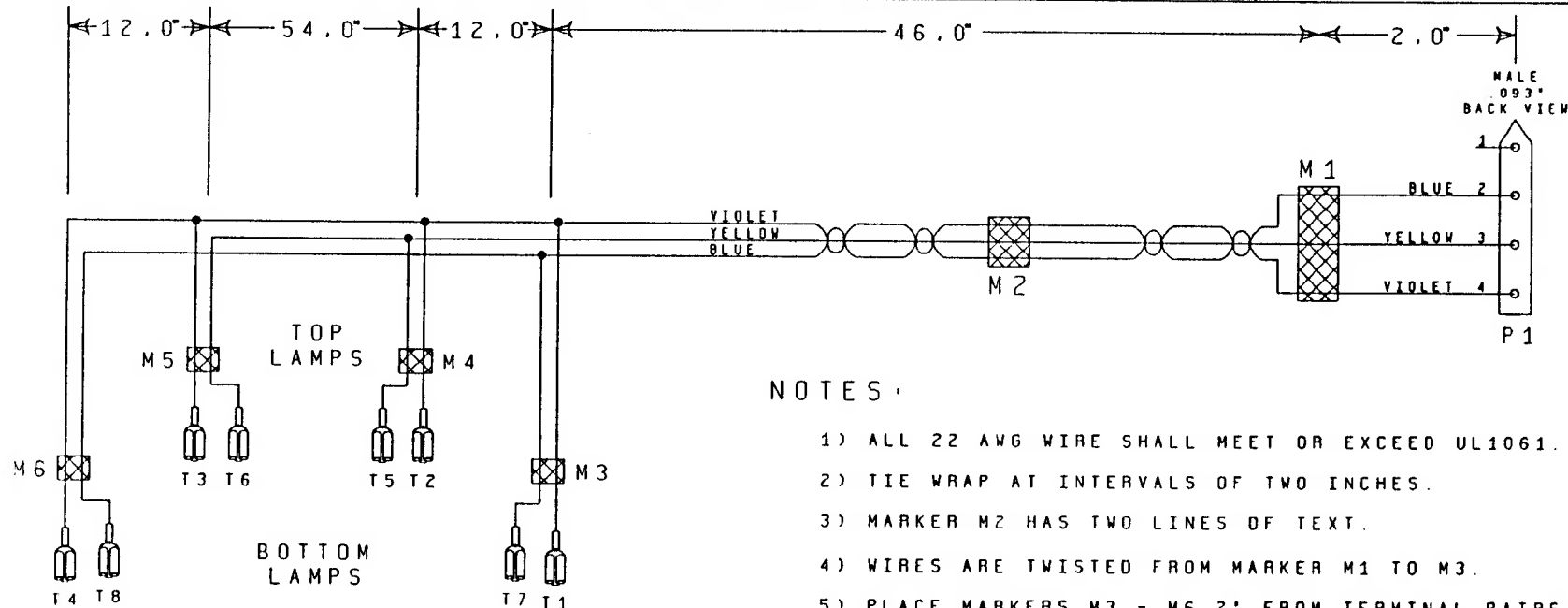
PARTS LIST			
REF DES	MFG	PART NO	PIN NO
P1	MOLEX	03-09-2032	02-09-2116
J1	MOLEX	03-09-1032	02-09-1117
J2	MOLEX	03-09-1049	02-09-1117
T1	MOLEX	C-236-08X	RING TERM

MARKER LIST				
REF DES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS1.9-3758W	.125"	(LINE 1) FLUOR LITE Y CABLE (LINE 2) DW-00014C-0029-02

NOTES:

- 1) ALL 18 AWG WIRE SHALL MEET OR EXCEED UL1015.
- 2) TIE WRAP AT INTERVALS OF TWO INCHES.
- 3) MARKER M1 HAS TWO LINES OF TEXT.
- 4) ASSEMBLED HARNESS IS MPG P/N A18-00003-015.

DRAFTER DAVID J. BERNARDY 12-12-90		DATE 12-12-90		MICROPROSE GAMES 180 LAKEFRONT DR. HUNT VALLEY, MD 21030	
ENGINEER JAY G. McKIBBIN 12/13/90		DATE 12/13/90		TITLE FLORESCENT LIGHT 'Y' CABLE	
APPROVAL [Signature]		DATE 12/13/90		SIZE C	
DRAWING NUMBER DW-00014A-0029		REV - 02		RELEASE	
DATE 12-12-1990 16:56		SHEET 1 OF 1			



NOTES:

- 1) ALL 22 AWG WIRE SHALL MEET OR EXCEED UL1061.
- 2) TIE WRAP AT INTERVALS OF TWO INCHES.
- 3) MARKER M2 HAS TWO LINES OF TEXT.
- 4) WIRES ARE TWISTED FROM MARKER M1 TO M3.
- 5) PLACE MARKERS M3 - M6 2" FROM TERMINAL PAIRS.
- 6) TWO WIRES ARE CRIMPED IN T1 - T5 & T7.
- 7) ASSEMBLED HARNESS IS MP6 P/N A18-00003-016.

PARTS LIST

REFDES	MFG	PART NO	PIN NO
P1	MOLEX	03-09-2042	02-09-2118
1 - T8	AMP	2-520184-4	

MARKER LIST

REFDES	MFG	PART NO	TEXT SIZE	TEXT
M1	BRADY	HCPS.9-3758W	.125"	SHROUD LAMPS
M3	BRADY	HCPS.9-3758W	.125"	BOTTOM LAMP 1
M4	BRADY	HCPS.9-3758W	.125"	TOP LAMP 1
M5	BRADY	HCPS.9-3758W	.125"	TOP LAMP 2
M6	BRADY	HCPS.9-3758W	.125"	BOTTOM LAMP 2
M2	BRADY	HCPS1.9-3758W	.125"	(LINE 1) UPPER SHROUD HARNESS (LINE 2) DW-00014C-0030-02

WIRE LIST

(ALL WIRE IS 22 AWG)

SIGNAL	FROM	TO	COLOR	BELDEN PART NO
SH_RED	P1-02	T7	DK BLUE	9921-13
	T7	T8	DK BLUE	9921-13
SH_YEL	P1-03	T5	YELLOW	9921-4
	T5	T6	YELLOW	9921-4
SH_12V	P1-04	T1	VIOLET	9921-7
	T1	T2	VIOLET	9921-7
	T2	T3	VIOLET	9921-7
	T3	T4	VIOLET	9921-7

DRAFTER DAVID J. BELLEVY		DATE 12-10-90	
DESIGNER JAY G. MCKIBBIN		DATE 12/13/90	
MICROPROSE GAMES 180 LAKEFRONT DR. HUNT VALLEY, MD 21030 TITLE UPPER SHROUD HARNESS			
APPROVAL <i>[Signature]</i>		SIZE C	DRAWING NUMBER DW-00014C-0030
DATE 12-11-1990		REV - 02	RELEASE CABLE 18
SHEET 1 OF 1			